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Address.

MODERN PRINCIPLES IN THE CONTROL AND MANAGEMENT OF CANCER.[*]

By Edward Reynolds, M.D., Boston.

The subject of cancer is too extended and complicated to make it possible for me to deal with more than a few points in the topic within the limits of a brief address. I propose to speak briefly of the recent changes in our knowledge of the malignant diseases, of the general principles which now underlie accepted treatment, and then to go as far in consideration of the diagnosis and treatment of the disease in its most common situations as may be permitted by the time at my disposal.

The American Society for the Control of Cancer has been conducting for six years a nation-wide campaign in the education of the laity on the all-important subject of the recognition of the premonitory and early signs of cancer (which term I shall use throughout this address, for the sake of brevity, as covering the entire subject of the malignant diseases except when the more specific names are used). The Society has at the same time been active in urging diffusion of the latest views among the medical profession through the agencies of the several state medical societies with which it has been in coöperation.

The experience which it has been my privilege to gain in the course of this campaign has led me to feel that there has been one particular factor which has been the great stumbling block to the rapid diffusion of the latest views among the profession, as distinguished from the laity. The minds of the laity have not been confused by preconceived ideas, and for this reason the seeds of the newer knowledge, to use a simile, have found the ready reception and rapid dissemination which always characterize the sowing of seed on virgin soil; but, to pursue the simile, when the same seed is offered to the minds of the medical profession its reception and dissemination are but too apt to be prevented and choked out by the strongly implanted weeds of a previous education which we now know to have been incorrect.

It is always a hard task to rid one's self of ideas which have been articles of faith for many years, but this is the task which now confronts us. The appearance of the newer pathology and natural history of the malignant diseases has been so recent that there is probably hardly a man in this room who was not educated to a conception of cancer which we now know to have been mistaken. We were all taught that the malignant growths are malignant from the start, and that a growth that could once be demonstrated to be benign would remain benign until the end of the chapter. We were taught in consequence a carefully elaborated differential diagnosis between malignant and benign new growths,—all this, unfortunately, pseudo-knowledge, we must now abandon. If there is one point in this whole subject upon which all authorities are now agreed it is that there is no sharp line between the benign and the malignant, but that, upon the other hand, very many malignant new growths originate in, or about, originally benign new growths or ulcers.

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[*] Read before the Essex North District Medical Society.

A malignant new growth in any situation is frequently the product of a continuous chronic irritation. The first result of such an irritation is hypertrophy of the normal tissues; this is followed by proliferation, then by the extension of the epithelial* elements into the surrounding non-epithelial tissues, and the assumption by the individual cells of the malignant characteristics, in successive stages. The earlier stages of this process often produce the benign new growths or ulcerations, the later stages the malignant. Most benign new growths must be regarded as possessing potential malignancy. Of course statements so general as these must not be taken without reserve—it is impossible to make a brief general statement which is not open to exceptions. The lipomata, for instance, are almost invariably innocent throughout their history, while there are situations in which malignancy appears so early in the history that it may almost be said that there is no recognizable stage of chronic irritation, nor even a recognizable wholly benign stage, but the general principle above enunciated underlies the whole subject, and is our safest guide.

The signs and symptoms which we were all taught to use in diagnosing cancer are now regarded as the signs and symptoms of developed and established malignancy, and therefore of malignancy which has become almost, if not wholly, insusceptible of a radical cure, although it must be remembered that even in these stages much may be done towards alleviation, and that in occasional cases radical cure may still result. The essential change in our views, which we must all achieve, is an acceptance of the modern idea that the duty of the physician to his patients is now to recognize, diagnose, and treat radically the conditions which ordinarily precede cancer in its several situations, and which are for the most part readily curable if radical treatment is adopted before actual malignancy has become established. In the more difficult situations in which malignant disease appears (and especially in that very common seat, the several organs of the digestive system), the diagnosis in the early and curable stages can be made only by the use of the comparatively intricate and expensive methods of modern laboratory diagnosis: moreover, if success is to be obtained these methods must be used in such cases at a time when the symptoms do not warrant anything more than a suspicion, and to wait for a probable diagnosis by simpler methods usually involves the loss of the patient's chance of life. Here the physician must be ready to explain the situation with all its doubts and possibilities frankly, and to advise the patient to push diagnosis to its ultimate possibility at the start, rather than to play the chances on delay.

The latest researches show that the disease is not contagious from one individual to another, and that in the human race, at least, the influence of heredity is probably negligible. The general principle of treatment is the immediate removal of any mechanical or physiological irritation which could conceivably cause an existing thickening or ulceration, and if this removal of irritation is not promptly followed by the disappearance of the lesion, an immediate and thorough excision of the induration or ulcer while it is still benign, by an incision made through unaffected tissues and without entering the lesion itself. There is an almost universal consensus of authority that, except in the case of a few of the very superficial and at most slow or semi-malignant new growths of the skin, radiation and the use of the cautery should be avoided during the early stages, though both these expedients have their place and are agencies of great value in the palliation of advanced and probably incurable disease.

The more important of what are now commonly spoken of as the precancerous conditions (those which predispose to cancer but are not malignant) are as follows: moles (and especially pigmented moles), keratoses, ulcers of the skin and orifices of the body, gall-stones, ulcers of the stomach, ulcers of the mouth, cystitis, erosions of the cervix, premature or obstructed involution of the breast, uterus and prostate, the adenomata, the papillomata (especially in the intestines, bladder and thyroid glands), cysts in the ovary and breast, because they tend to develop papillomata of their linings, polyps of the uterus or rectum, and, in general, all epithelial neoplasms.

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* Except in the sacromata, where the malignant process of course originates in connective tissue.

In general, the observance of the dictum "*Ubi tumor, ibi incisio* (*excisio*)"—"Where you find a new growth, there you should do an excision,"—may be accepted as a far safer general principle than any other, though to the expert it is by no means without its exceptions.

These statements are so entirely at variance with the preconceived opinions of at least the elder part of the profession that they are likely to sound at first hearing wildly radical, and it is, therefore, only fair for me to say that in making them I believe that I am not speaking a merely personal opinion, but from what I know to be the accepted view among those surgeons whose experience entitles their opinion to the greatest weight.

The general acceptance by the profession of these views, which is rapidly progressing, will undoubtedly lead to the performance of some minor operations which might have been avoided, but we believe that it will also lead to a comparative rarity of the extensive, destructive and mutilating radical operations which are now so common, and which so frequently lead to no more than an interval of immunity from symptoms.

The natural history, diagnosis and standard operative treatment of the malignant growths vary so greatly with the different situations in the body in which they occur as to require for detailed consideration a different description for each situation, but I fear that in the time at my disposal it will hardly be possible to speak of the detailed application of the general principles above outlined to any more than a few of the situations in which cancer most frequently occurs. I shall probably be obliged to make even those remarks too brief and "sketchy." The American Society for the Control of Cancer has, however, in preparation a handbook for physicians which will deal exhaustively and authoritatively with each of the many manifestations of malignant disease in concise and practical form. It is hoped that this will be ready for distribution within a few months, and any physician who writes to the American Society for the Control of Cancer, 25 West 45th Street, New York City, may count upon receiving it as soon as it is in print.

The malignant diseases of the skin are among the most frequent of all forms, and from their situation are susceptible of very early diagnosis. They appear mainly among elderly people, are slow in progress, have a long precancerous stage, and even after the actual appearance of malignant cells, tend to remain localized somewhat longer than in most other situations.

There are two types—the squamous epitheliomata of the surface and those carcinomata which originate in the follicles of the skin. The squamous form tends to extend into the lymphatic glands earlier than the other. The squamous epitheliomata appear as persistent scaling spots which later form crusts which, when picked or knocked off, reveal an indolent ulcerative surface. The carcinomata of the follicles are for the greater part of their history ulcerative, many of them falling into the clinical class of rodent ulcers. Both patients and physicians are too apt to regard both of these forms in their earlier stages as small nuisances rather than as potential sources of death.

The differential diagnosis demands the exclusion of syphilis and tuberculosis, but since the excision of these little spots is so trifling a matter, all doubtful cases should be so treated.

In the earlier and strictly pre-cancerous stages they may be treated on the face, hands or other prominent places by radiation, cauterizing agents or freezing mixtures, which result in little or no scar, but if there is even a doubt as to the existence of actual malignancy, as shown by long persistence, marked increase of size, or induration about an ulcer, they should be submitted to wide excision through plainly unaffected tissues, and submitted to microscopic examination at the time of operation. If this shows any doubt as to the character of the tissues, at least the nearest set of lymphatic glands should be radically removed.

All tissue so removed should be at once submitted to the microscope for an accurate diagnosis, even though it is believed to be in a thoroughly benign or pre-cancerous stage. This should, moreover, be done at the time of the operation, and if malignant tissue is found, the radical operation appropriate to the situation of the growth should be performed at the same sitting. The postponement of the radical operation for even the few days necessary for the submission of the specimen to subsequent microscopic examination unfortunately results in a far greater percentage of recurrence. Even when the immediate examination is negative the tissues should subsequently be carefully studied by a pathologist since serial sections will sometimes disclose a nidus of malignancy which was missed in the immediate examination and the immediate performance of a radical operation at a second sitting after the least possible loss of time, is, then, the next best chance. The necessity of pathological examination of tissues should be emphasized with even more force for those cases in which circumstances may seem to render it necessary to operate for suspected malignant disease in localities where the immediate pathological examination is unattainable. Free examination of tissue removed at operation should be available wherever the surgery of malignant disease, even in its earliest stages, is practised. In some States, laboratories for the free diagnosis of suspected tissue are maintained by the state universities, or by the State Department of Health. In Massachusetts a service has been organized by the Cancer Commission of Harvard University, in coöperation with the State Department of Health, and is in successful operation.

In new growths of the eyelids the use of radiation is justifiable at much later stages than elsewhere since the excision of growths from this situation is so deforming and so destructive to the eye.

The several organs of the digestive system are among the most common seats of cancer, especially in men, and are unfortunately among the most unfavorable since, from their inaccessible situation, the diagnosis of the precancerous stages is so difficult and the operations for the eradication of even the pre-cancerous lesions are, moreover, serious, but the application to these diseases of modern methods of laboratory diagnosis will, neverthless, result in the saving of a proportion of the cases.

Cancer of the stomach is very common and rather slow in its initial stages. Its symptoms and signs are at first only those of chronic indigestion with, later, bloody vomitus, loss of weight and change of color, especially in middle-aged or elderly people. The pre-cancerous stage is that of simple ulcer of the stomach, and this is, fortunately, of rather long duration. The diagnosis of simple ulcer is effected by analysis of the stomach contents and the use of the x-ray after a barium meal. While some simple ulcers heal under medical treatment, it is now a recognized principle that those cases which do not improve with promptitude should be treated by a wide excision of the ulcer, immediate pathologic examination and, in case of doubt, excision of the lymph nodes.

Cancer of the colon is not rare in elderly people. It occurs most frequently in the descending colon, rather less frequently in the ascending, and rarely in the transverse portion. Its early symptoms are persistent colic with bloody stools and later attacks of obstruction. The diagnosis is made by use of the x-ray after a barium meal and enema, and by the exclusion of the ordinary sources of rectal bleeding through a proctoscopic examination. In doubtful cases the physician should have no hesitation in recommending an exploratory abdominal incision. In this situation the disease has long precancerous and localized malignant stages, and the prognosis on early operation is not bad. The standard operation is a wide resection of the affected gut with the radical removal of the corresponding mesentery and its lymphatic nodes. In this situation success rests, perhaps more than in any other, on willingness to perform an exploratory operation for a mere justifiable suspicion of a growth without waiting for a positive diagnosis. A positive diagnosis can rarely be made until the case is beyond the prospects of cure.

Cancer of the rectum is fairly common at all ages over thirty. It is moderately rapid. The prognosis is not good except when it is operated upon in the very earliest stages. The only symptoms at this time are rectal bleeding and moderate tenesmus. The differential diagnosis between incipient cancer and internal hemorrhoids can be made only by physical examination with the finger and proctoscope. Every case of rectal bleeding should be subjected to physical examination as soon as reported to the physician. From the nature of the organ, the operation, even in the early stages, is necessarily extensive. The results are best when performed in two stages, a preliminary colostomy and a subsequent excision of the rectum, but if the disease is detected before it is extensive the function of the anus can frequently be preserved and the colotomy may then be allowed to close.

Cancer of the pancreas, liver or gall-bladder is rare, and is inoperable except when incipient cancer of the gall-bladder is discovered in the process of removing gallstones.

Cancer of the breast presents a very different picture from that of the digestive organs. It is one of the most common forms and becomes generalized very soon after the actual appearance of malignancy. It may occasionally be malignant when first noticed by the patient, but, on the other hand, it usually has a long and definite pre-cancerous stage, which is almost always easily recognizable and can be removed by an exceedingly trifling operation. Cancer is, perhaps, more controllable in this situation than in any other. The usual stages in the development of the disease are cystic dilatation of one or more of the milk ducts, proliferation of the epithelial lining of the cyst, usually the formation of papillomata within the cyst, extension of the proliferating epithelium into the surrounding tissues, and the axillary or subclavian invasion of the lymphatic glands. During the merely cystic stage the disease is painless, but owing probably to some slight sensation of distention the patient usually finds it with her fingers. She is prone to wait until it becomes painful before seeking the physician, and in the past the profession has been too prone to wait for progressive enlargement and perceptible invasion of the axilla before advising operation.

The modern principle of practice is that any chronic lump in the breast which has persisted for a month without decrease should be removed. This principle will undoubtedly lead to an increase in the number of minor operations, but is justified by their good results and their trifling nature.

In this stage the standard operation is the removal of the cyst and of a pie-shaped bit of breast which contains all the ducts behind the cyst through a small radiating incision, and by a dissection which goes clear of the cyst. The cyst should be immediately submitted to (frozen section) pathological examination, made during the continuance of the operation, and if it is benign nothing further is needed and the patient may be about her business in a day or two. Such an operation involves no danger, practically no mutilation, and should have a hundred per cent. of immunity from recurrence.

In case the immediate pathological examination shows the presence of even a minute quantity of malignant tissue, the entire breast should be removed with the skin over it and with the pectoral muscles. The incision should then be extended into the axilla, and the lymphatic contents of the axilla and the subclavian space should be removed precisely as though the original disease in the breast were in an advanced stage. At this stage an extensive radical removal has an extremely high percentage of subsequent immunity, probably more than ninety per cent., although a few weeks later and after the disease is clinically recognizable as carcinoma the percentage of permanent immunity is lamentably small.

When an irritation or enlargement of the ducts is central and near the nipple, it may be attended by slight sero-sanguineous discharge from the nipple, and in this case the primary operation, during even the pre-cancerous stage, must necessarily involve the removal of the nipple and the entire breast. This is, fortunately, a rare condition.

When the lump is in the upper and inner quadrant of the breast, in which the scar of a radiating wound would be objectionable, the patient's feelings may be spared by making a curved incision around the outer or lower edge of the breast, separating the organ from the underlying tissues and removing the necessary pie-shaped wedge from the under side of the breast and without invasion of the skin. Though this operation is more extensive and involves a little longer convalescence, it is no more serious and may be preferable for cosmetic reasons.

Cancer of the uterus: The uterus is a very common seat of the disease, which here has two forms,—the squamous carcinomata of the cervix and the adeno-carcinomata of the body. They differ greatly in natural history and also in prognosis.

The squamous carcinomata of the cervix are extremely malignant and extend nearly through the lymphatic ducts of the broad ligaments into the retro-peritoneal glands along the spine. This disease is, however, almost always (probably invariably) preceded by an irritating cervical leucorrhea and consequent erosion of the vaginal surface of the cervix. If prompt and efficient minor treatment and, if necessary, curettage is applied in this stage, the possibility of future malignancy is done away with, but such cases should always be kept under observation for some time after apparently complete relief. When the erosion is so deep and permanent as to resist minor treatment the cervix should be amputated and submitted to the microscope. If it is found to be benign no further treatment is needed; if the stage of proliferating invasion of the underlying tissues has been reached, an immediate pan-hysterectomy is the standard procedure, and if done very early in this stage, will yield considerable percentages of permament immunity. The clinical symptoms at this stage are an ichorous and frequently offensive leucorrhea with slight bleeding after trauma, as in coitus or douching, and later, but usually only after the establishment of malignancy, intermittent hemorrhage without trauma. When actual malignancy is present, permanent relief is rare in this situation. The adeno-carcinomata of the body begin as mere non-malignant adenomas of the mucous membranes. They later assume a carcinomatous character and extend throughout the thickness of the uterine wall, accompanied by progressive increase in the size of the organ. In this situation the disease generalizes slowly and mainly by direct extension until at a late stage it penetrates the peritoneal surface of the uterus, and its cells then rapidly disseminate themselves throughout the peritoneal cavity and give rise to secondary papillomatous growths at whatever places they may chance to attach themselves. The only early symptoms of the disease are increased catamenial flowing and, more significant, occasional irregular sanguineous discharges, usually small in quantity and serous in character. The presence of this symptom with an even slightly enlarged uterus makes immediate operation imperative. It should consist of curettage, submission of the fragments to the microscope and complete hysterectomy at the same sitting if indicated. The curettage should be conducted with great gentleness, as the uterine walls are frequently thin and fragile, and the least penetration by the curette would render general peritoneal diffusion inevitable. The prognosis after hysterectomy is almost uniformly favorable in the early stages of the disease (even after some actual carcinoma is present), and is often unexpectedly favorable even in the presence of fully-developed disease, so long as peritoneal perforation has not taken place.

Cancer of the ovary is comparatively rare. Its natural history consists of the development of papillomata and later carcinoma within the cavity of a previously benign cyst. Later it progresses into deep infiltration of the wall of the cyst, followed usually by an adhesion of the cyst to surrounding organs and penetration of the carcinoma into the attached tissues.

The pre-cancerous stage is the presence of a simple ovarian cyst, and the standard operation at all stages is the removal of the affected ovary. The obsolete process of tapping the cyst to facilitate its removal adds greatly to the danger of recurrence. The prognosis is good so long as the disease is confined within the cyst.

Cancer of the urinary organs is rather rare. Although hematuria may be due to many other causes, its presence in even slight degree should always excite a suspicion of this disease, and should lead to a careful differential diagnosis between stone, new growths and tuberculosis; but lack of time must prevent further discussion of these and the other less frequent sites of malignant disease, and also of the less common sarcomatous forms.

A few words should be said in closing about the very important subject of the palliation of inoperable cancer. Here radiation takes an important place. The x-ray is available for the more superficial forms, while radium exerts a deeper effect. Both forms of radiation are especially apt to be useful in advanced cancers of the cervix, prostate, and about the mouth and nose; also in Hodgkin's disease, which must be rated as closely cognate to the true malignant neoplasms. Radiation relieves pain, decreases hemorrhage and offensive discharges.

Palliative operations are often extremely useful for the same purposes, even in the absence of any hope of cure. The removal of sloughing portions of a superficial growth by the knife, or knife and cautery, often temporarily decreases the patient's suffering. In many situations ligature of a number of the nutrient arteries often leads to decrease of size in the growth and to consequent decrease or even considerably prolonged disappearance of pain. Operations which sidetrack the seat of the growth or lead to decreased motion of the affected organ, such as tracheotomy, gastro-enterostomy, and colotomy often result in great alleviation of symptoms, as do neurotomies or deep infiltration of the plexi which supply the affected part. This subject of palliation of the later stages of this extremely painful and distressing affection has received too little attention and should be considered in the conduct of every case.

Original Articles.

THE ENERGY CONTENT OF EXTRA FOODS.

BY CORNELIA GOLAY BENEDICT, BOSTON, AND F. G. BENEDICT, BOSTON.

[From the Nutrition Laboratory of the Carnegie Institution of Washington, Boston, Massachusetts.]

IN computing the caloric intake of groups of individuals either from a budget or from food supplied at the table, the fact is usually disregarded that food* frequently is taken away from the table or regular place of eating. Personal queries for a number of years and observation of the habit of others have led us to the firm conviction that there is an almost universal custom of taking food of appreciable caloric value other than at the three regular daily meals. This may be assumed to be a definite factor in American life, having its economic as well as its social side. That this extra food habit has become more or less general is further demonstrated by the enormous sales of alcoholic and temperance drinks, candy, ice cream, pies, fruits, sugar buns, etc.

The American soda fountain which has been increasingly developing for the last two decades, together with the preparation and sale on an extensive scale of ice cream, has perhaps contributed more than any other one factor to the general use by the public of extra calories away from the family table.

There is, moreover, in a large cosmopolitan city a great variety of foods in a palatable form without any preparation, and specific information regarding those most generally used is absolutely necessary. An institution so thoroughly established as the English afternoon tea would of course be recognized by all as a legitimate, appreciable source of energy in computing the total daily diet. But with a vast number of individuals all energy-containing foods, or drinks, taken other than at the table three times a day are usually not taken into account. In no instance is this more strikingly shown than in the ordinary record of the physician examining the patient at his office. The patient will invariably report the foods eaten at the three meals at the table, but will almost invariably neglect the extra edible materials taken outside of the house. Rarely does the physician himself think of this factor, and it is safe to say that when he does he is surprised, as indeed the patient is, at the relatively large amount of material taken away from the table.

The casual way in which these food materials are taken leaves one with the impression that they cannot play any important rôle in the contribution of total energy intake in the course of the day. As a matter of fact, this is fundamentally wrong. It is wholly illogical to disregard energy eaten in a handful of nuts, a banana, a glass of soda water, a portion of ice cream, or even alcoholic beverage, for in a daily quota of calories, the calories in these incidentals should be as legitimately computed and included, as those in the slice of bread taken in the more conventional manner at the family table. Indeed much of the evidence thus far submitted would go to show that these extra food calories can form an appreciable percentage of the total daily requirement. Since a continuous excess of foods amounting to but five per cent. would invariably result in obesity, and is distinctly in the nature of overeating, the extra food consumption must not be neglected in any consideration of excess food or obesity.

On the other hand in many instances, these excess calories undoubtedly lessen the demand for caloric intake at the regular three meals, and thus become a legitimate factor in the supply of the maintenance food for the day. Under these conditions it can be seen that actual quantitative knowledge of the food value of these extra foods is essential, indeed of prime importance. Based in large part upon the computed composition of extra food materials, considerable evidence is already accumulated to show that these extra foods may form at least ten per cent. of the total daily intake. Perhaps one of the most striking illustrations of this is an admirable study made by Gephart[1] of boys at St. Paul's School, Concord, where it was found that out of a total intake of approximately 5000 calories the boys took 640 calories in the form of extras such as candy, chocolate, and sugar buns which came from the shops in the vicinity of the school grounds. Although lacking a complete quantitative determination the questions asked of the members of the dormitory in which the recent dietary study at Vassar College was made, indicate that a considerable number of the students were inclined to take noticeable amounts of extra foods, which in all probability comprised not far from ten per cent. of the total daily intake.

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* In the series of articles of which this is the first, we purpose using the expression "extra food" for all sources of energy for the body taken between meals.

In an unpublished research conducted in connection with a series of reduced diet experiments at the International Y.M.C.A. College at Springfield, Mass., the Nutrition Laboratory staff noticed that with the ordinary college student, on an uncontrolled diet, approximately ten per cent. of the total calories of the day were obtained in the form of edible material other than that taken at the regular dining hall. Although the studies cited have been confined for the most part to boys in schools or to college students, it may not be unreasonable to assume, for the purpose of discussion at least, that approximately ten per cent. of the calories of the day are taken away from the table by the general public.

In industrial centers, undoubtedly, lunches from special lunch-stands take the place of the home table meal especially at midday. This noon lunch may, however, be legitimately considered as the third meal of the day, and articles thus eaten should not be confused or considered as under extra foods. Recently there is a tendency on the part of large industrial organizations to provide a more or less standardized meal at the noon hour. But nevertheless it can be seen that the midday meal in industrial centers at least is in large part the taking of a ration not easily computed and not easily included in a classification of the caloric intake of the day.

For the purpose of computing the rate of daily intake of food, however, the nature of this midday meal should be better known. The Nutrition Laboratory feels that a quantitative study of the most popular extras and their combinations is essential in indicating not only the amount of the noon lunch, when recognized as stated above as a third meal of the day, but particularly as indicating the character of the extra foods not ordinarily considered as a factor in the total daily caloric intake.

The problem divides itself into two, namely, the study of the character, nature, the per cent. of the nutrients of the foods ordinarily consumed at midday lunches, the amounts, and the analysis of these lunches to see whether they are balanced rations or not; and second, the analysis of the several extra foods other than those commonly eaten at noonday lunches, with particular reference to chocolate, candy, sweet drinks, etc.

Thanks to a long series of investigations on the part of the U. S. Dept. of Agriculture, we know with a reasonable degree of accuracy the caloric intake of the staple food materials, such as wheat, bread, meat, sugar, etc. From the deservedly oft-quoted tables of Atwater and Bryant the computations of the daily intake of calories from the budget, from the inventory of the house, before and at the end of the test may easily be made. These tables are, however, deficient in data with regard to many of the modern forms of preparation used by individuals with considerable freedom from day to day. We believe that a study should be made of these materials.

Such a study should comprise analyses and weights of portions of all extra foods and drinks, both non-alcoholic and alcoholic. In this report, we purpose studying the group of the special cooked materials, extra foods, that are frequently consumed by the American public. We hope, subsequently, to consider many of the standardized lunches, or ingredients of lunches, and to obtain some evidence with regard to the caloric intake in many of the alcoholic beverages.

In the beginning of this study it seemed best to commence with the simplest elements such as crackers, ready-to-eat materials, chocolate, candies, and more particularly the products of the American soda-fountain. Emphasis will primarily be laid upon the energy content. But wherever appreciable amounts of protein are to be found, these will, as a rule, be given. At present in the computation of dietaries, indeed, in the apportionment of food materials among the different individuals, the significance of any difference between fat and carbohydrate as sources of energy does not seem as important as it is where extreme restrictions of fat are necessary, as in the other warring countries. Consequently, we have not in this first report made an effort to lay any emphasis whatsoever upon the relative proportion of fat and carbohydrates in the various ingredients. On the other hand, owing to the marked tendency to the general restriction of protein, we have given the protein contents where it is appreciable.

METHOD.

The general object was to secure so far as possible representative samples of the various food materials which we are here to report. Certain of these such as chocolate, candies, and particularly crackers, are manufactured on a large scale by concerns of national reputation, and are very well standardized. These materials being for the most part relatively water-free can be purchased in standard packages and found in practically every store in the United States. Unbroken packages were purchased, weighed, measured, and carefully aliquoted for analyses. Certain of the regularly bottled beverages were likewise purchased in standard form and analyzed as received. The products of the soda-fountain are for the most part mixed by the several operators or servers at the time purchased, and consequently can be only approximately standardized. It became necessary therefore to secure a sufficient number of these samples to serve as a probable measure of the energy content of these various mixtures.

The method of collecting these is as follows: At a soda-fountain two or three glasses of soda-water or "sundaes" were purchased and taken to a waiting automobile as if for immediate consumption. As there was nothing to indicate to the clerk at the fountain that the mixtures were for study, there was no opportunity given him to prepare them to make a special impression. In the automobile were numbered preserving jars into which the sodas were emptied, care being taken to transfer all that would ordinarily be consumed, and in a note book under the number of the jar was recorded the description of the soda, place of purchase, and price. This proceeding was repeated at various fountains. At the laboratory the jars as brought in were weighed, then emptied and rinsed in boiling water (to remove all fat), and the empty jar weighed. The sodas were placed in a drying oven and dried sufficiently to allow combustion. In some cases, where there was a large amount of free fat after drying, a known amount of powdered pumice stone as an energy-free fat absorbent was mixed with the material in order to secure a homogeneous sample. Where there were nuts or fresh fruits the partially dried material was rubbed in a mortar.

With plain and milk cake chocolates it was only necessary to cut pieces of the desired weight. Nut chocolates were put several times through a meat chopper and then sampled. Crackers were put through a meat chopper and samples of the resulting powder pelleted. Ginger ales, grape juices, etc., were dried and as the resulting material was homogeneous it prevented no difficulty in sampling. In a few cases of the latter it was necessary to add a known weight of sucrose as a kindler to effect combustion.

ANALYSES.

In this report we record only the determinations of the nitrogen where appreciable quantities of protein are to be expected, and the heat of combustion. The nitrogen was determined by the usual Kjeldahl method.

The heat of combustion we consider of prime importance here. Usually the calories of food materials have been computed by analyses, multiplying the amount of carbohydrates, fat, and protein by the several factors in computing the calories. This method, however, is subject to a number of errors. In the first place the water content even of dried material is very variable. Second, a complete analysis, of each substance is essential and not only tedious but is time-consuming and difficult to make. Third, all the possible errors in computation fall upon the carbohydrates and not upon the water or ash. It is necessary to determine directly *water*, *ash*, and *fat*, and *protein*. The errors in all analyses fall by difference upon the heat-forming carbohydrate and not upon the water or ash, that is, the energy-free ingredients.

On the other hand, if the heat of combustion is determined directly it gives a true value of the energy content and needs correction only for that fraction of the protein calories which are not available to the human body but excreted unoxidized as urea and allied compounds in the urine.

We determined directly the heat of combustion by the calorimetric bomb which was formerly prohibited in most laboratories as it required an elaborate equipment and considerable time and skill. More modern technique reduces the time element very appreciably. The calorimeter[2] devised in the Nutrition Laboratory uses the adiabatic principle employing an electric heater in the outer water-bath. As the apparatus is used by us, one operator and one assistant* can easily make four combustions with computations in one hour. The calorimetric bomb is thoroughly standardized by frequent combustions with pure sucrose from the Bureau of Standards. All calories are computed at or near 20° Centigrade.

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* It is a privilege here to express our warm appreciation of the most intelligent and faithful coöperation of Miss Marion L. Baker.

In the combustion of the several samples, sufficient material was selected to produce approximately a temperature rise of 1.5° Centigrade, the hydrothermal equivalent of the bomb calorimeter and water was 2400 grams and the total heat developed inside the bomb was usually not far from 3½ to 4 calories. Hence in most materials about one gram of material could be used. In the case of fat substances from 0.7 to 0.8 grams were used. With homogeneous samples, the difference in the heat of combustion with duplicate determinations is almost invariably inside of one per cent. In some of the more complicated foods, especially those containing fat materials, and those difficult of sampling, differences of two to three per cent. were not infrequent.

The chocolates used were such as could be purchased in different stores in Boston and vicinity, and comprised sweet chocolate, milk chocolate, and nut chocolate.

Sweet Chocolate.

No. 4. Whitman's Sweet Chocolate Cigarettes, 10 sticks in package, each stick 67 mm. long by 7 mm. diameter.
No. 1. "Dot" Sweet Chocolate, Walter Baker Co., 132 x 67 x 7 mm., 18 sections.
No. 8. Baker's Caracas Sweet, 131 x 61 x 5 mm., 18 sections.
No. 9. Henry Wenz' Coffee Chocolate, 2 cakes, each 105 x 60 x 5 mm.
No. 10. Vanilla Chocolate, Henry Wenz, 137 x 77 x 6 mm.
No. 11. S. S. Pierce Co. Overland Vanilla Chocolate, 142 x 70 x 5 mm.
No. 12. S. S. Pierce Co. Overland Coffee Chocolate, 142 x 70 x 5 mm.
No. 13. Bunch 4 cakes, tied up in tinfoil, each cake 36 x 20 x 8 mm.
No. 14. Baker's Sweet Vanilla Chocolate Croquettes, 16 cakes, 55 mm. diameter x 4 mm. thick.
No. 7. Baker's Sweet Chocolate, Vanilla, 188 x 90 x 11 mm., in 6 sections.
No. 15. Pierce's Overland Chocolate Croquettes, 20 cakes, each 56 mm. diameter x 4 mm. thick.
No. 56. Puritan Sweet Chocolate, 38 x 21 x 6 mm., from penny-in-the-slot machine.
No. 105. Stollwerck's Gold Brand Chocolate, 145 x 71 x 7 mm., 40 squares.
No. 106. Chocolate Cinquième, Walter Baker Co., 143 x 71 x 8 mm., 6 sections. For use also in making beverage.
No. 142. Sweet Chocolate, Park & Tilford, 145 x 75 x 10 mm., 6 sections.

Milk Chocolate.

No. 2. Hershey's Sweet Milk Chocolate, 142 x 74 x 2.5 mm., 18 sections.
No. 5. F. L. Cailler's Genuine Sweet Milk Chocolate, 160 x 65 x 7 mm., 24 sections.
No. 6. Peter's, The Original Sweet Milk Chocolate, 147 x 67 x 4 mm., 18 sections.
No. 139. Borden's Milk Chocolate, 160 x 80 x 4 mm., 24 sections.
No. 141. Auerbach's Milk Chocolate, 145 x 75 x 5 mm., 9 sections.
No. 143 Sweet Milk Chocolate, Park & Tilford, 164 x 72 x 6 mm., 24 sections.
No. 149. Nestlés Sweet Milk, Peter Cailler Kohler, 235 x 116 x 15 mm., 16 sections.

Nut Chocolate.

No. 16. Lovell & Covell's Nut Chocolate, 78 x 45 x 14 mm.
No. 17. Lowney's Almond Milk Chocolate, 116 x 44 x 5 mm., 5 sections.
No. 18. Lowney's Nut Milk Chocolate, 105 x 40 x 8 mm., 6 sections.
No. 24. Choco-Fruto, Frank N. Dallinger & Co., 132 x 68 x 3 mm., of chocolate, malt, dried fruit and nuts.
No. 135. Stollwerck's Almond Sweet Milk Chocolate, 145 x 53 x *ca.* 8 mm.
No. 136. Nut Tootsie Rolls, Stern & Saalberg Co., 6 cylinders, diameter 21 x 16 mm. thick.
No. 137. Borden's Almond Sweet Milk Chocolate, 112 x 41 x *ca.* 5 mm.
No. 140. Touraine Chocolate Nut Bar, 114 x 41 x *ca.* 6 mm.
No. 144. Peter's Sweet Milk Chocolate with toasted almonds, 157 x 56 x *ca.* 8 mm.
No. 145. Cailler's Sweet Milk Chocolate with toasted almonds, 120 x 45 x *ca.* 4 mm.

Ginger Ales, Grape Juices, etc.

No. 103. Pureoxia Ginger Ale, Pureoxia Co.
No. 104. Moxie.
No. 119. Welch's Grape Juice, The Welch Grape Juice Co.
No. 120. Lakeside Grape Juice, Harris Grape Juice Co., with about 2% cane sugar.
No. 121. Armour's Grape Juice.
No. 122. Phez Loganberry Juice, with sugar, Pheasant Fruit Juice Co.
No. 123 Red Wing Grape Juice, Puritan Food Products Co., less than 2% granulated sugar.
No. 124. Schühle's Grape Juice, Schühle's Pure Grape Juice Co.
No. 125. The Daggett Co.; Pure Grape Juice, Boston, "granulated sugar added."
No. 146. Cantrell & Cochrane's Ginger Ale, aromatic.
No. 147. Clicquot Club Ginger Ale, Clicquot Club Co.

Plain Crackers.

No. 27. Butter Thin, Loose-Wiles Biscuit Co., carton of 33, 52 mm. diameter x 3 mm. thick.
No. 36. Saltine Biscuit, National Biscuit Co., carton of 46, 52 x 52 x 5 mm.
No. 37. Graham Crackers, National Biscuit Co., carton of 35, 66 x 66 x 4 mm.
No. 38. Uneeda Biscuit, National Biscuit Co., carton of 21, 70 x 70 x 6 mm.
No. 88. Oatmeal Crackers, Loose-Wiles Biscuit Co., in bulk, each cracker 68 x 70 x 4 mm.

Sweet Crackers.

No. 25. Tokens, National Biscuit Co., carton of 52, each 47 x 47 x 2 mm.
No. 29. Five O'clock Tea Biscuit, National Biscuit Co., carton of 18 vanilla and 16 chocolate crackers, each 50 mm. in diameter by 3 mm. thick.
No. 32. Educator Ginger Snap, a carton of 36, 40 mm. diameter by 4 mm. thick.
No. 33. Educator Sweet Graham Crackers, carton of 34. 47 mm. diameter by 5 mm. thick.
No. 34. Zu-Zu Ginger Snaps, National Biscuit Co., carton of 27, 45 mm. diameter by 5 mm. thick.

No. 35. Lemon Snaps, National Biscuit Co., carton of 27, 45 mm. in diameter by 5 mm. thick.
No. 86. Macaroons.
No. 138. Lady Fingers, double, each 83 x 25 x 15 mm.

MIXED CRACKERS.

No. 20. Al Fresco Cheese, National Biscuit Co., in cartons of 60, each 60 x 23 x 5 mm.
No. 22. Peanut Sandwich, National Biscuit Co., a carton of 17 sandwiches, 2 crackers with peanut filling, each sandwich 48 mm. diameter by 44 mm.

FRUIT CRACKERS.

No. 23. Fig Sni-Bar, Loose-Wiles Biscuit Co., carton of 16, each 43 x 45 x 10 mm., with fig filling.
No. 26. Frotana, National Biscuit Co., carton of 24, each 40 x 50 x 5 mm.
No. 28. Fig Newtons, National Biscuit Co., carton of 15, each 42 x 42 x 9 mm.

SUGAR WAFERS.

No. 19. Educator Kremox, a carton of 10, chocolate flavored, 5 of which were 45 x 45 x 7 mm.; 5, 35 mm. in diameter by 7 mm. thick.
No. 21. Anola Wafers, National Biscuit Co., tin of 24, each 43 x 35 x 5 mm.
No. 30. Nabisco, vanilla flavor, National Biscuit Co., tin of 33, 64 x 19 x 15 mm.
No. 31. Nabisco, chocolate flavor, tin of 35, 65 x 19 x 5 mm.
No. 87. Hydrox, bought in bulk, a chocolate cracker with cream filling, each 50 mm. in diameter by 5 mm. thick.
No. 89. Nabisco, chocolate flavor, tin of 36, like No. 31, but larger size, each wafer being 90 x 30 x 5 mm.
No. 149. Perfetto Assorted Sugar Wafers, Loose-Wiles Biscuit Co., a tin of 28, each 73 x 21 x 5 mm.

The results of the determinations of the heat of combustion, of the various specimens of chocolates are recorded in Table I. The chocolates are arranged in the table in three different groups, plain, milk, and nut chocolate. No special order has been observed in their arrangement in the tables and no special significance is to be attached to the cost or size of package or net weight, which obviously would vary with the different manufacturers' standardized packages. All analyses are based upon the air-dried material, and in Table I are recorded, first, the net weight; second, the calories per gram. From these are computed the

TABLE I.

CHOCOLATES.

Lab. No.	Name	Net Weight Grams	Calories per Gram	Total Calories	Calories per Section	Cost, Cents	Calories for Ten Cents	Nitrogen per Cent.
	PLAIN							
4	Whitman, Cigarettes	41.6	5.416	225	22.5	15	150	
1	Walter Baker, Dot	75.6	6.198	468	26.0	8	585	1.10
8	“ “ Caracas	52.0	5.592	291	16.0	5	581	
7	“ “ Vanilla Sweet	234.1	5.649	1323	220.5	21	629	
14	“ “ Croquettes	220.2	5.570	1226	76.5	28	438	0.60
106	“ “ Cinquième	92.5	5.559	514	85.5	7	735	
13	S. S. Pierce, Cakes	25.6	5.660	145	31.5	5	289	
9	Wenz, Coffee	55.9	6.046	338	169.5	·15	225	0.90
10	“ Vanilla	57.9	6.018	348		10	348	
12	Overland Coffee	37.5	5.939	222		15	148	
11	“ Vanilla	40.2	6.006	242		10	242	0.90
15	“ Croquettes	216.8	5.904	1281	64.0	40	320	0.90
56	Puritan, Penny size	5.8	5.826	34	34.0	1	337	
142	Park & Tilford	118.8	5.391	641	106.5	10	641	
105	Stollwerck	83.4	5.876	490	12.0	10	490	
	MILK							
6	Peter's	37.6	5.849	220	12.0	10	220	
5	Cailler's	80.6	5.706	460	19.0	10	460	1.06
2	Hershey's	44.0	5.715	251	14.0	6	419	
143	Park & Tilford	77.6	5.910	459	19.0	12	382	
139	Borden	71.1	5.732	408	17.0	15	272	
141	Auerbach	32.8	5.468	180	20.0	6	299	
149	Nestlé	421.0	5.728	2412	151.0	59	409	
	NUT							
3	Waneta, Milk	47.5	6.291	299		6	498	1.20
16	Lovell & Covell	54.6	5.758	314		6	524	1.60
17	Lowney's Milk Almond	33.4	5.761	192		6	321	1.10
18	“ “ Nut	38.1	5.769	220		6	366	1.40
144	Peter's Milk Almond	73.0	6.169	450		12	375	1.80
145	Cailler's Milk Almond	30.4	5.940	181		6	301	1.20
135	Stollwerck's Milk Almond	83.3	6.015	501	100.0	12	417	1.30
136	Nut Tootsie Rolls	44.9	4.850	218	36.5	6	363	1.40
137	Borden's Almond Milk	31.7	6.040	191	38.5	6	319	1.60
140	Touraine Nut Bar	35.6	5.992	213		6	355	1.70
24	Choco-Fruto	54.6	4.300	235		15	157	0.60

total calories, and since practically all of the chocolates are by the manufacturer subdivided more or less into sections and are eaten frequently as sections, we have given the calories per section. Finally, as of general economic interest we append the cost per package and the calories obtainable for 10 cents.

The amount of nitrogen present in these several chocolates is, in those other than nut, very small. In the milk chocolates, since a certain amount of milk powder is usually incorporated in these products, we find the percentage of nitrogen averaging not far from 1.5 or corresponding to a total of not far from 9 per cent. of protein. Considering first the plain chocolates with regard to the special calorimetric studies, we find that the calories per gram range from a minimum of 5.391 in the case of sample No. 142 to a maximum of 6.198 in the case of sample No. 1; average of 15 samples is 5.8 calories. Although we have not determined directly the fat percentages in these, the differences in calorific value are in all probability to be ascribed to differences in the proportion of fat[*] in the product. A general average figure would indicate not far from 5.6 calories per gram for plain chocolates. The total calories obviously vary greatly and in direct proportion to the net weight of the package. Similarly, the calories per section are determined solely by the subdivision of the package by the manufacturer.

From the economic standpoint[†] the calories for 10 cents are of unusual interest. They range from a minimum of 148 calories in the case of sample No. 12 to a maximum of 735 calories in the case of sample No. 106. It is thus apparent that by proper selection of sweet chocolate, one may obtain a fairly large number of calories for 10 cents. It is very important, however, to bear in mind that the sale value of these products in large part depends upon their flavor and it is not justifiable to compare these chocolates solely upon the basis of the economic value of calories per gram.

With regard to the milk chocolates, the calorific value of the seven samples here recorded averages 5.7 calories. The total calories excepting in the case of sample No. 149 do not differ so widely and the calories per section have a narrow range of from 12 to 20 calories. Computing the calories for 10 cents, we find the values range from 220 to 460, meeting neither of the extremes noted with the plain chocolates. It is obvious again that the value of milk chocolates must in large part be in pleasing the palate and there is nothing whatever in this record of analyses to show any superiority of one quality over the other.

With the nut chocolates a rather large number were analyzed. Here the calories per gram average 5.7. The two exceptions in the table noted herewith are No. 136 and No. 24, both of which would, strictly speaking, not necessarily come under the head of nut chocolates. The number of calories for 10 cents ranges from 157 to 524. The nitrogen percentages here average not far from 1.5 or approximately 9 per cent. of protein. Since the average net weight of each package is, however, not far from 50 grams, it can be seen that a whole package would contain on the average hardly more than 4 1-2 or 5 grams of protein. Criticism must be directed against the absurd statement accompanying sample No. 24 "affording a well balanced full meal or two substantial lunches." The whole package contains but 235 calories and would have hardly more than 2 grams of protein, facts which do not bear out in any way the claim of the manufacturer.

Many of these cakes as recorded in Table I are of such size, 50 to 60 grams, as to be eaten in entirety. Indeed, it is not uncommon to know of individuals eating a good share of some of the larger packages, and hence it is of considerable importance to note the very large number of calories that can be thus obtained. Few of the original packages contain less than 200 calories. Several, at least, contain more than 1200. Five hundred calories eaten at once in one of these packages would be by no means considered a large portion, and yet it must be borne in mind that 500 calories is nearly one-third the basal caloric requirement of normal man and may represent from one-fifth to one-sixth of the total daily requirements of the average man not at severe muscular labor.

Crackers in different varieties are a form of extra food taken in large amounts, particularly by women. These are frequently consumed in connection with the afternoon tea or, indeed, in combination with not a few of the soda-fountain products. We have combined in Table II the analyses of a number of the more commonly used forms of crackers, in which we give the weight per cracker, calories per gram, calories per cracker, and in a number of instances the percentage of nitrogen, although in the majority of cases this is very low. The calories per gram range from 4 to 5, with a general tendency for the average values to lie about midway between these two figures. Since these crackers are usually purchased in standard packages, and since it is rare that anyone eats any considerable proportion of the package, it seems inadvisable to put in the cost per package or the calories per 10 cents.

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[*] Complete analyses of the various kinds of chocolate have been reported by Drs. Jenkins, Street, Bailey and Winton, in the annual reports of the Connecticut Agricultural Experiment Station at New Haven, especially for 1903 and 1911. Physicians may well familarize themselves with the wholly exceptional work in the analysis of food preparations, including diabetic foods, continuing at this station.

[†] In the cost, as indicated in Table I, and the calories per 10 cents, it should be borne in mind that not a few of these articles have had a material increase in price recently. Thus many packages that have sold for 5 cents now sell for 6, and hence the economic relationship of these figures must be interpreted in the light of condition of present (1918) prices.

TABLE II.

CRACKERS

Lab. No.	Name	Weight per Cracker Grams	Calories per Gram	Calories per Cracker	Nitrogen Per Cent.
	Plain				
36	Saltine	3.8	4.682	18.0	1.5
37	Graham	9.6	4.659	44.5	1.3
38	Uneeda	6.6	4.500	29.5	1.4
27	Butter Thin	4.5	4.785	21.5	1.4
88	Oatmeal	10.0	4.565	46.0	1.4
	Sweet				
25	Tokens	3.7	4.469	16.5	1.2
29*a*	5 O'clock Tea (vanilla)	4.9	4.594	22.5	1.1
29*b*	5 O'clock Tea (chocolate)	5.0	4.688	23.5	1.2
32	Ginger Snaps	3.2	4.242	13.5	0.9
33	Sweet Graham	5.2	4.498	23.5	1.4
34	Zu-Zu	4.6	4.403	20.0	1.1
35	Lemon Snaps	4.0	4.482	17.5	0.9
	Fruit				
23	Fig Sni-Bar	12.4	3.889	48.0	0.7
26	Frotana	8.2	4.038	33.0	0.7
28	Fig Newtons	15.2	3.888	59.0	0.6
	Mixed				
20	Al Fresco Cheese	1.9	4.720	9.0	2.6
22	Peanut Sandwich	10.2	4.970	51.0	2.1
	Sugar Wafers				
19	Educator Kremox*	7.4 12.8	4.820	61.5 35.5	0.8
21	Anola	4.5	5.370	24.0	1.5
30	Nabisco, vanilla	2.1	5.021	10.5	0.8
31	Nabisco, chocolate	2.4	5.018	12.0	0.8
87	Hydrox	11.3	5.025	56.5	0.7
148	Perfetto	2.8	5.096	14.5	
138	Lady Fingers	16.4	4.202	68.5	1.4
86	Macaroons	8.5	5.082	43.5	1.4
89	Nabisco, chocolate	4.6	4.972	23.0	0.6

* Two sizes.

In considering these crackers it is, however, important to note the special conditions obtaining in the American manufacturing situation at the present day, where wheat substitutes must be employed and undoubtedly some of these standard products are somewhat different from those used in ante-war conditions, and some are not now obtainable in the market, but it is not impossible that the original formulas may be returned to when the raw materials become more readily accessible. They do represent, however, the composition at this date, 1918, and from the heat of combustion per gram we have no reason to believe that any great change in either the heat of combustion or the proportion of protein would be introduced by the resumption of the original formula.

The products of the American soda-fountain are of special interest not only for their increasing consumption by the American public but their increased use during the summer. Although we undoubtedly have here again to deal somewhat with special war conditions, inasmuch as there is a curtailment of sugar and a distinct tendency to lessen the amount of pure cane sugar used, it must be recognized that the calorific values of the several drinks here recorded represent probably minimum rather than maximum values.

Considering soda water first, we have recorded the material in Table III. Usually three kinds of soda water are sold, plain soda water, i.e., carbonated water, with a plain syrup, usually either vanilla or chocolate; second, to this combination is added "cream" which may range in composition from anything like top milk to a very heavy cream; and third, and becoming increasingly important each year is the addition of ice-cream. The plain soda-waters analyzed comprise three specimens of chocolate and one of vanilla. On the average not far from 200 calories are found in each glass with a cost of 5 cents per glass. The addition of cream in the second part of Table III has in some instances noticeably brought up the calories, such as, for example, in sample No. 73.

TABLE III.

SODA WATERS

Lab. No.	Flavor	Total Calories	Cost, Cents
	Plain		
46	Chocolate	203	5
95	"	268	5
93	"	172	5
45	Vanilla	239	5
	With Cream		
73	Chocolate	357	10
42	"	247	5
101	"	222	5
96	"	109	5
71	Vanilla	230	5
72	"	167	10
79	"	170	5
81	"	134	5
102	"	197	5

Yet, on the other hand, with vanilla, except for sample No. 71, the calories per glass run distinctly low, nearer 160.

The increasing use of ice-cream soda led to our analyzing a relatively large number. These are recorded in Table IV. As before, the most generally sold flavors are chocolate or vanilla, either vanilla syrup with vanilla ice-cream or chocolate syrup with vanilla or chocolate ice-cream or, in the spring season, fresh fruit, chiefly strawberry, with either strawberry or vanilla ice-cream. At or about the time these samples were taken there was a general movement in this vicinity to increase the price from 10 to 15 cents, so 5 specimens costing 15 cents appear in this list. It is perhaps significant that these 5 specimens all have a rather high calorific value. One would expect that in the chocolate material with the proportion of fat in chocolate somewhat larger than in vanilla, higher values would be found, and the table indicates that this is the case. Two of the chocolate samples show 467 and 443 calories respectively, and none of the vanilla samples show this value. It is quite clear in collecting these samples that there was rather marked individuality on the part of the several clerks as to the amount of ice cream served, or the amount of cream added. The products are, therefore, by no means standardized, yet it is safe to assume that in the average ice cream soda, chocolate flavor, 350 to 400 calories are obtained; while with the vanilla, the average will run nearer 325. Although the actual highest number of calories was obtained in the 15 cent portions, it is important to note that one vanilla ice-cream soda gave 385 calories for 10 cents and one chocolate 377, so the number of calories is by no means proportional to the cost. Here again flavor, neatness of environment, and prestige determine the selling price.

TABLE IV.

SODA WATERS.

ICE CREAM (WITH CREAM)

LAB. No.	FLAVOR	TOTAL CALORIES	COST, CENTS
77	Chocolate, chocolate ice cream ...	467	15
80	" " " " ...	443	15
82	" " " " ...	251	10
50	" " " " ...	348	10
100	" " " " ...	377	10
74	" vanilla ice cream	354	10
44	" " " "	314	10
48	" " " "	374	10
98	" " " "	349	10
91	Fresh Strawberry, vanilla ice cream	436	15
76	Vanilla, vanilla ice cream	321	10
78	" " " "	394	15
43	" " " "	286	10
47	" " " "	385	10
49	" " " "	322	10
99	" " " "	286	10
97	" " " "	202	10
92	" " " "	399	15

Another popular product of the American soda-fountain is the so-called "sundae" or college ice. These are becoming more and more extensively used, permit of a very large variety, and only representative samples could be analyzed. Since a very large number of them are served with crushed or chopped nuts, it seemed advisable to determine the amount of protein as well as energy in each portion. These are recorded in Table V. The almost universal price for the "sundae" or college ice is at present 15 cents. As can be seen from the table, a large variety is served. The calories per portion range from the lowest of 225 to as high as 516. It is of great importance to note that with the ordinary college ice it is not impossible to secure from 400 to even more calories in each portion. In only 5 cases did the calories run below 300. It is also of interest to note that in each portion as now served with chopped nuts, one may obtain from 4 to 9, average of not far from 6, grams of protein. With the present tendency towards restriction in protein and the attempt to adjust the nation on a much lower protein level, the amount of protein obtained in a college ice or "sundae" must certainly be recognized.

TABLE V.

SUNDAES

LAB. No.		TOTAL CALORIES	PROTEIN. GRAMS	COST, CENTS
	Chocolate ice cream			
108	Chocolate sauce, walnuts	327	6	15
109	" " "	516	6	15
111	" " "	433	5	15
114	Fudge sauce, walnuts	412	6	20
116	Marshmallow sauce, walnuts	383	4	15
117	" and chocolate sauce, walnuts	429	4	15
127	Maple walnut sauce	419	4	15
130	Strawberry sauce	235		10
131	" "	225		10
	Strawberry ice cream			
107	Fresh strawberry sauce	277		15
110	" " "	406		15
126	Strawberry sauce	257		15
134	" " and marshmallow	412		15
	Vanilla ice cream			
112	Fresh strawberry sauce	334		15
113	Marshmallow sauce, walnuts	350	4	20
115	Chocolate sauce, walnuts	396	9	15
118	Marshmallow sauce	251		15
128	Chocolate sauce, nuts	371	7	15
129	Strawberry sauce	304		15

Another product having an enormous sale, particularly among children, is the so-called "ice cream cone." Three of these are analyzed and reported in Table VI. The uniform sale price is 5 cents.

TABLE VI.
ICE CREAM CONES

LAB. No.	FLAVOR	TOTAL CALORIES	COST, CENTS
94	Vanilla ice cream	82	5
132	Chocolate ice cream	132	5
133	Vanilla ice cream	114	5

The three samples varied considerably in the total number of calories, averaging not far from 115. It is thus seen that at 5 cents they do not present a particularly economic source of energy.

Although this report deals more particularly with the beverages dispensed from soda-fountains rather than with bottled soda waters, a most popular bottled beverage is the so-called "ginger ale," of which three specimens were analyzed. They are given in Table VII herewith. The total calories range from 78 in the case of an imported ginger ale to 136 in the case of a domestic brand. The price varies considerably, but again is in large part determined by the flavor and in no sense by the number of calories. The total quantity, likewise, varies considerably. What is of special importance, however, is to note that by drinking a bottle of ginger ale one may obtain as high as 135 calories.

TABLE VII.
TEMPERANCE OR "SOFT" DRINKS.

LAB. No.	NAME	TOTAL CALORIES	COST, CENTS	CONTENTS CLAIMED
103	Pureoxia Ginger Ale	133	10	14 oz.
146	Cantrell & Cochrane Ginger Ale	78	20	9.6 oz.
147	Clicquot Club Ginger Ale	136	15	15½ oz.
119	Welch's Grape Juice	158	15	½ pt.
120	Lakeside Grape Juice	200	10	6 oz.
121	Armour's Grape Juice	315	19	1 pt.
123	Red Wing Grape Juice	368	30	1 pt.
124	Schühle's Grape Juice	331	22	1 pt.
125	Daggett Co. Pure Grape Juice	398	22	1 pt.
122	Phez Loganberry Juice	529	35	12 oz.
104	Moxie	322	20	1 pt., 10 oz.

Another very commonly used beverage is the so-called "Moxie." A large original bottle of Moxie contained 816 grams, and is supposed to yield approximately 7 glasses of special standard type, in which this beverage is almost invariably sold. The total calories in a large bottle are 322, giving, therefore, not far from 40 to 50 calories per individual glass.

In recent years the use of unfermented grape juice has enormously increased. Usually this consists of the expressed juice of the grape with but relatively small amount, if any, of cane sugar. The bottles are usually of either pint or half-pint size, and analyses of 6 samples in Table VII herewith show that the total calories in 1-pint are reasonably constant, varying only from 315 to 398 calories. In the half-pint specimen, No. 119, the calories would correspond to 316 calories per pint. Since, however, grape juice is rarely consumed directly without addition of water, it is only of importance to note that in the average pint bottle of grape juice one may expect to find approximately 350 calories.

A new product that has been extensively introduced in recent years is the expressed Loganberry juice, sold under the trade name of "Phez." This as bottled is mixed with sugar and is usually consumed mixed with water. The bottle is marked as containing 12 fluid ounces, and the calorific value, owing to its greater concentration, is essentially twice that of an equivalent volume of grape juice.

GENERAL DISCUSSION.

The wide variety of products of the American soda-water fountain and so-called "soft" or "temperance" drinks would make it impossible to record with any great degree of accuracy the exact composition of many of these materials. On the other hand, we have given in these tables a sufficient number of analyses to show that we have to deal with a rather appreciable number of calories in the ordinary serving or portion of many of these beverages. With the ginger ales or with Moxie this, perhaps, does not play any great rôle, possibly with the grape juice, owing to its dilution with water. But certainly with the plain or ice cream sodas or college ices, the caloric content is of real significance. The patient may report to the physician an extremely light breakfast, the fact that no lunch whatever is taken, and a very modest dinner, and entirely disregard the fact that one or two, or even more, ice creams, sodas, or similar materials, are regularly taken. Five hundred calories, whether in the form of steak or in the form of ice cream, are the same so far as the supply of energy to the human organism is concerned. Indeed, 500 calories in the form of ice cream may have an actually greater effect upon obesity than 500 calories in steak, since in the latter case we have the stimulating effect of the protein to assist in burning up the calories and the fact that a portion of the calories from protein is excreted unchanged. It is extremely difficult to discuss this question from the economic standpoint for, as has been repeatedly stated, one may not deal solely with calories and disregard flavor. Nevertheless, the calories obtained from these extra foods are, it is seen, considerable. Indeed, they may in a large number of cases become excessive, and a number of instances of obesity or beginning obesity may, without doubt, be directly ascribable to the more or less habitual use of these important foods. On the other hand, one must not lose sight of the fact that for a large number of people the convenience, the readiness for consumption, make many of these products extremely palatable, convenient to use, and, as we have seen, of real caloric value. While every effort should be made to oppose the substitution of the hastily gulped product of the soda-water fountain for a quiet lunch with relaxation, and all effort should be directed towards minimizing the American habit of rushing to a lunch counter and rushing away again, these products have their legitimate place in our economic as well as social life, and it is of great importance to recognize their calorific value.

It is, perhaps, not out of place here to sound a note of warning against too great a restriction of the products of the American soda-fountain. The great tendency at the present time of American legislative life is towards the prohibition of the manufacture and sale of alcoholic liquors, primarily, it is true, as a war measure. There is a popular belief which seems to be reasonably well substantiated, that the increased consumption of "soft" drinks, soda-water products, distinctly contributes towards lessening the demand for alcoholic liquors. Hence, in the efforts for conservation of sugar, due recognition must be taken of the important rôle played by these popular American drinks, and the curtailment of their manufacture and sale should be entered into only after a serious recognition of the important rôle they play.

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TRAINING SCHOOL FOR HOSPITAL APPRENTICES AT THE BOSTON CITY HOSPITAL.

BY JOHN A. FOLEY, A.B., M.D., BOSTON,
Executive Assistant, Boston City Hospital.

THE Boston City Hospital, at the suggestion of Capt. John M. Edgar, Medical Inspector of the First Naval District, has established a training school for hospital apprentices. This, like all courses for men in the service, is of an intensive nature and is already bringing very successful results.

The district embraces all the New England States, and men from the entire area are centered at the hospital for training. After enlistment the men are sent to a naval station for a period of quarantine and drill; during this time they also receive their inoculations and vaccinations. When this period is over they are detailed to the Hospital for training as hospital aides or male nurses.

The instruction is given by members of the hospital staff under the direction of the Acting Superintendent, Edmund W. Wilson, M.D. This institution offers an ideal field for instruction of this sort, because of the immense variety of cases treated here. The hospital in all its departments contains ten hundred and sixty-one beds, six hundred and fifty of which are in the main hospital, where the men are receiving training. The Accident Department receives on an average of one hundred cases a day for first aid. Here instruction in all branches of first aid is furnished.

The Surgical Out-Patient Department treats over three hundred cases each morning, and here instruction is given in the after-treatment of wounds and operative cases. In the Genito-Urinary Out-Patient Department the men are instructed in the care and treatment of such cases, special care being given to the value of systematic and prolonged treatment.

On the operating floor there are from twenty to thirty major operations a day, including many emergencies. Here the men are instructed in the setting up of an operating room, the care of patients recovering from ether, and the preparation and sterilization of surgical dressings and instruments.

On the wards the men are instructed by the head nurses and their assistants in the nursing care, and among other things they are given special instruction in:

The care of rooms, sweeping and dusting.

Care of set bowls, wall stands and utensils.

The use of hot and cold applications, including the making of fomentations and poultices.

The care of rubber goods.

The making of surgical supplies, pads, sponges, etc.

The use of slings, binders and supports.

Most of the apprentices are graduate pharmacists and consequently are well acquainted with antiseptics, disinfectants and deodorants, and the preparation of solutions. They are instructed in the principles of heat radiation and its relation to body temperature. They are instructed in the taking and recording of pulses and temperatures. They are taught very carefully how to give alcohol sponge baths, bed baths, besides the regular care of the mouths and backs of patients.

In addition to the practical work, there are demonstrations in anatomy and physiology and pathology, and every student must witness at least one post-mortem examination.

There are special courses in x-ray, laboratory technic and dietetics.

To these courses men are sent who show special desire for this sort of instruction.

In the x-ray department, care is taken to instruct men as technicians, so that they may be of assistance to the doctors later. They are taught how to take plates, and how to develop them, how to give bismuth meals and enemata, and how to index and file plates which have been taken. In addition there are special lectures to the entire class in which the theory of x-ray is explained.

The class in laboratory technic is conducted in the clinical laboratory of the hospital. Here the men are taught the fundamental principles of urinalysis, blood counts, the staining of smears, and examination of stools and stomach contents. The men in this department are under the constant supervision of a nurse trained in this sort of work.

The hospital dietitian gives six afternoon demonstrations to a group of twelve men at a time. In this class the men are taught how to prepare dishes especially appetizing for the sick. The men are very quick to pick up this branch of the work, and enjoy it very much.

At present there are about thirty-two men on duty at the hospital and they are divided into two watches,—port and starboard. One watch comes on duty at 8 a.m., and goes immediately to the stations assigned. The second watch comes on duty at 12 noon, when both watches go to lecture for an hour. At 1 p.m. the men go to dinner, which is furnished by the hospital. At 1.30 p.m. both watches return to duty until 4 p.m., when they go to drill or class in form-instruction, popularly termed "paper work," which is conducted by Pharmacist J. F. Durkin. At 5 p.m. the afternoon watch goes to supper, returning to duty at 5.30 p.m. and remaining on duty until 8 p.m.

The supervision of the men at the hospital is under the direction of one of the executive assistants, who places the men, arranges their lectures, and keeps their records.

Considerable interest has been aroused by the experiment, and numerous inquiries have been made regarding the work. The arrangement has worked out very satisfactorily both for the men and the hospital. The men learn rapidly and remember what they learn. They are considerable help to the hospital while on duty in that they furnish man power, which allows the hospital to split its very meager day force so as to supply the shortage at night.

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Clinical Department.

IMPACTED STONES OF THE BLADDER AND URETHRA.

BY WALTER D. BIEBERBACH, M.D., WORCESTER, MASS.

[From the Genito-Urinary Service of the Worcester City Hospital.]

IN reporting this case of impacted stone involving the bladder and posterior urethra, I believe it brings out two points of interest: first, the enormous amount of stone found; second, cause and starting point of formation of the calculi.

Generally, urethral stones form in the kidneys, pass through the ureter, remain for a varying time in the bladder, and then pass into the urethra. However, in my case, I believe the original starting place was in the posterior urethra.

On April 19, 1918, N. B. was admitted to the genito-urinary service of the Worcester City Hospital. He was a man thirty-seven years of age, a cook by occupation, and was born in Russia. About twenty years ago he suffered from a urethral infection which was followed by gradual narrowing of the urinary stream. About four years from the date of his infection he was taken suddenly with complete retention of urine. Instruments were tried to relieve his condition, but failed, and he was removed to the Wilkesbarre City Hospital in Pennsylvania, where an external urethrotomy with retrograde catheterization was performed. He recovered after a stormy convalescence, but never returned for dilation. For a year or so he had no apparent urinary symptoms. Soon after this he noticed his stream was again becoming narrower. He consulted several physicians but was informed that they were unable to pass the point of obstruction. During this time the stream became smaller, and finally down to a drop stream. About three years ago he was told by a physician that he had a stone and would have to be operated upon to get relief. He declined operation and for the past two years has been able to pass only a few drops of urine when the bladder became overdistended. Finally he began to suffer from such excruciating pain that he applied to the Worcester City Hospital for relief.

Examination. The patient, a male, in good physical condition, with an apparently strong, robust constitution and fairly well-nourished body. He had all signs and symptoms of retention, complained of severe pain over the suprapubic region and in the deep perineum, with a continual dribbling of urine. Between the umbilicus and symphysis pubis, in the middle line, was a large round puckering scar, showing the results of a former suprapubic cystotomy that evidently had gone septic. In the perineum, extending from the scrotum to within an inch of the anus, was another scar with a broad base, showing that healing had taken place following septic infection. As the patient lay on his back, a few drops of urine would dribble from the external meatus every few seconds, the patient having no control over his condition, simply tossing from side to side, and showing all signs of being in intense pain. He constantly placed his hand over the deep perineum as if to give it support, stating that in this region he was having terrible pressure pain. On palpation over the abdomen one could outline a large distended bladder. Inspection of genital organs showed them to be normal in appearance except for a long prepuce, reddened from being continually bathed in urine. The urethra could be easily felt and traced to the peno-scrotal angle. It was hard and fibrous. On deep pressure in the region of the membranous urethra a hard and somewhat round mass could be felt, giving rise to a sharp stabbing pain. Prostate felt moderately enlarged, hard, and was very sensitive. I could not reach or palpate the base of the bladder. A sound, No. 21 French, was introduced within the urethra and met with resistance at the bulbo-membranous junction. Slight pressure at this point caused a free bubbling of urine to follow the sound and to be expelled in jet-like sprays from the external meatus. When this pressure was exerted at the place of stricture it would cause severe pain to the patient, especially in the rectum and posterior urethra.

Being unable to pass the point of obstruction in the urethra, a filiform was introduced, but failed to pass. The filiform was withdrawn and the tip heated and bent at right angles. It was then passed to the place of the stricture and rotated in a circular movement until it engaged into the small strictural opening for a distance of about one inch. The filiform was threaded on a Gouley sound and passed through the stricture, where it came suddenly to a stop in what could be felt as a somewhat soft, sandy mass, transmitting the click of stone along the metal Gouley. As slight pressure was exerted at this point, small jets of urine gushed forth from the external meatus, demonstrating that the impacted stones acted as a ball valve, thus preventing the patient from emptying his bladder. A diagnosis was made of impacted stone of the posterior urethra, and the patient was referred to the roentgenologist for an x-ray. Dr. Philip H. Cook, Roentgenologist, Worcester City Hospital, reported that the x-ray picture showed impacted stone in the posterior urethra (prostatic) and two large vesical calculi lying low on the base of the bladder.

Operation. A perineal incision was made in the middle line down to the membranous urethra. This was easily found, being well dilated, in which could be palpated a large oval stone. Urethra was opened and stone removed. Directly behind this stone another was found, slightly smaller than the first. As the finger was carried to the prostatic urethra another round-shaped stone could be felt obstructing the entrance to the bladder. This was grabbed with a large pair of Kelly forceps, but could not be dislodged and had to be broken in piecemeal until the entrance of the bladder was reached. It was found that this projection of stone was a fundus of a large calculus that lay on the floor of the bladder wall, fitting tightly around the internal urinary meatus. The stone was so large that it was impossible to deliver it, and it was crushed through the urethra and removed in small pieces. With the index finger within the urethra, another somewhat round calculus of considerable size could be felt imbedded on the lower anterior wall of the bladder. I could just touch it with the index finger, and on account of shortness of reach it was impossible to dislodge the stone with the finger. A metal sound was introduced through the open incision and followed along the anterior surface of the index finger, that acted as a guide. The curved portion of the sound was slipped over the upper surface of the stone, acting like a hook, and the calculus was dislodged and dropped to the base of the bladder. It was of such size that it could not be delivered through

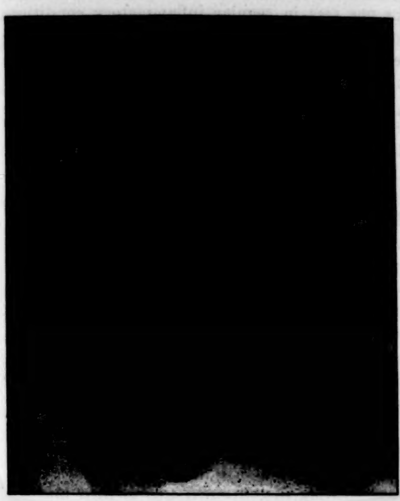

Fig. 1.—X-ray picture taken by Dr. Philip H. Cook, showing stones in posterior urethra and bladder.

the internal urinary meatus, and was crushed and removed in small pieces. The bladder was then thoroughly irrigated and all small pieces of stone removed. The final step of an external urethrotomy was completed and a large-size catheter inlying from the external meatus to the bladder for drainage.

The patient made an uneventful recovery and was discharged from the hospital twenty days after operation. He was able to pass his urine through the urethra, and at the present time is in good condition.

I believe that the history, examination, and operative findings show that the starting point of stone formation was in the urethra, behind the seat of stricture. Here the urinary deposits collected, piled upon themselves, filling the posterior urethra to the neck of the bladder, and then, as one large stone, it piled up in mushroom shape and extended over the base of the bladder wall.

Fig. 2.—Two stones removed from membranous urethra.

Fig. 3.—Entire mass of stone removed from urethra and bladder.

Fig. No. 1. X-ray plate taken by Dr. Philip H. Cook shows stones in posterior uethra and bladder. The small shadows were the two stones removed from the membranous urethra. The large shadow, that is pear-shaped, shows the stone with the fundus lying on the base of the bladder and its neck pushed down into the posterior urethra. The above round shadow was the large stone that was encysted in the lower anterior bladder wall.

Fig. No. 2 shows the two stones that were removed from the membranous urethra. The large calculus measures 4 centimeters in length and 3 centimeters in breadth; the smaller, 3 centimeters by 1½ centimeters.

Fig. No. 3 shows all stones removed from urethra and bladder, total weight being 4 ounces.

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Society Report.

NEW ENGLAND PEDIATRIC SOCIETY.

The fifty-third meeting of the New England Pediatric Society was held at the Boston Medical Library on April 12, 1918, at 8.15 p.m.

Dr. Charles H. Dunn, of Boston, in chair.

The following papers were read:

1. An Unusual Food-Borne (probably milk) Epidemic of Scarlet Fever, Edwin H. Place, M.D., Boston; H. Linenthal, M.D., Boston; A. B. Lyon, M.D., Boston; M. C. Cheney, M.D., Boston.

2. An Analysis of the Wassermann Reactions Done at the Boston Lying-in Hospital for the Years 1916-1917, John B. Swift, M.D., Boston.

3. Auto-serum Treatment of Chorea, F. H. Sylvester, M.D., Boston.

Discussion as follows:

Dr. Smith (Dr. Swift's paper): I am glad that Dr. Swift has brought up this matter for discussion. It seems to me that it is one of the things that we have to consider very seriously at the present time. As Dr. Swift says, it is a part of the general movement for child conservation which is being introduced everywhere in this country.

In regard to this particular subject, he has indicated a satisfactory solution of the problem, namely, closer coöperation between clinics and other agencies doing the same kind of work. No hospital should give up this work because the machinery has not been perfected. The machinery can be perfected, and I think the pregnancy clinic can contribute much to the general child conservation movement. I hope Dr. Swift's suggestions will be put into operation.

Dr. Swift (in closing): I might say in connection with Dr. Smith's statement that it is exactly what I hope is going to be the outcome of this paper. It is what I want to see done now.

Dr. Goodman (Dr. Sylvester's paper): I have followed with great interest Dr. Sylvester's excellent paper on the Auto Serum Treatment of Chorea, and must agree with him that the results he obtained were far from satisfactory. It is quite natural that Dr. Morse's deductions should be so unfavorable, and that he should feel justified in condemning the method, considering the report of cases just read. If this meeting had been held a few years ago, when I was the only one using this method, there might have been some doubt as to the accuracy of the favorable reports that I have published. Fortunately, I have received encouraging reports from many sources, both in this country and in Canada, from other men who have been successful in the use of the autoserum treatment of chorea.

In the early stages of the technic I, too, had unfavorable results; but by the development of improved methods I have eliminated all the reactions which you have just heard Dr. Sylvester report. Our patients do not have any rise of temperature; they do not vomit, they have no headache and suffer no discomfort whatsoever, except from the introduction and withdrawal of the needle. Any rise in temperature is positively due to faulty technic,—either there is an artefact in the circulating serum or asepsis has not been properly observed. Vomiting and headache are due to the introduction of too much serum, causing pressure symptoms such as one sees in regular inflammatory conditions of the cerebrospinal system. How these can be eliminated I will explain later. My first case taught me that drugs circulating in the blood plasma have a very potent effect when injected into the cerebrospinal canal. In the first case I had exactly the same results that Dr. Sylvester describes in many of his cases, but since I have insisted on allowing all patients to lie in bed four or five days without any medication, I have not had any such results.

Another important point in the technic consists in obtaining absolutely clear serum containing no red blood corpuscles. Tinged serum will cause a rise in temperature. It is necessary, therefore, at times rapidly to centrifugalize the blood for quite a long time before the serum becomes entirely clear. In the early days I diluted the serum with salt solution in order to have the specific gravity as near that of the spinal fluid withdrawn as possible, but I have entirely discontinued this method and use only the pure serum. In the beginning we also inactivated the serum but found that we had better results with the serum that was not treated in this manner. I have also tried the simple withdrawing of the spinal fluid as was suggested by Passini, but obtained no favorable results with this treatment.

Our technic is, briefly, as follows: We collect from any vein about 50 cc. of blood in a sterilized tube, place it in the centrifuge and rapidly centrifuge it until ths supernatant serum is absolutely free from any red corpuscles; then it has the usual straw, or slightly greenish color. We then place it in an ice box and keep it there for a few hours. The patient is prepared for a spinal puncture in the usual manner, the aspirating needle is inserted into the spinal canal, and we usually withdraw from 2 to 3 cc. more of spinal fluid than the amount of serum we intend to inject. In other words, if we inject 18 cc. of serum, we withdraw 20 to 22 cc. of spinal fluid. We use the syringe method in preference to the gravity method because with the syringe method we can estimate the necessary amount of serum to be injected without causing any pressure symptoms. After making a number of such injections, one develops a distinct sense of feeling that guides one in determining the exact amount of serum to be injected. No harm, however, can result from injecting too much serum. Headache or vomiting, or both, may result, but these disappear within a very few hours. It is urgent that after a spinal injection the patient be kept absolutely flat on his back in bed for at least one hour. We have a nurse stay with each case during this period.

We have made repeated examinations of the blood and spinal fluid in all our cases of chorea and have never been able to demonstrate any pathologic change. We have made hundreds of lumbar punctures in a study of spinal fluid in various diseases, and have never had any untoward results at any time. The auto-serum injection is just as harmless when properly done as a simple spinal puncture alone.

I am unable to state why Dr. Sylvester has had such unfortunate results, but I feel that they must be due to some error in technic at one stage or the other. All I can say is that we have eliminated all these unpleasant symptoms. We get good results in between 70% and 80% of our cases, and by this I mean that they are either cured or markedly improved. By a cure I mean all cessation of choreiform movements within the first few days. Only recently we had a case of so-called "electric" chorea that had been under treatment for nearly four months and was gradually getting worse; within twenty-four hours after an auto-serum injection the child was absolutely quiet. I feel entirely justified in recommending the use of the auto serum treatment, because if properly employed no reaction will follow. It is a marked improvement over all other forms of treatment recommended, and should one fail to obtain a satisfactory reaction, no harm can result. As I have stated in the beginning, I am supported by many others who have used this treatment with good results.

DR. GROVER (Dr. Sylvester's paper): At the time I was in New York last fall, I visited Dr. Goodman's Hospital. I saw four cases there at that time. Two of them had had the treatment for two or three days previous to my visit and the other two were about to receive it. The four I saw were not severe cases of chorea. Most of those treated at the Children's Hospital were of the more severe type. I remember particularly that we sent only the worst ones in from the Out-Patient Department. From what I learned from the interne at Dr. Goodman's Hospital, the same technic was used, except that they might have been more particular in having their serum corpuscle-free.

DR. MORSE (Dr. Sylvester's paper): I, of course, saw a good many of these cases while they were receiving treatment at the Hospital. All the cures happened while I was on my vacation. After I got back, there were no more cures.

My impression, as I watched these cases, was that the treatment did not do them any good. The reactions were in many cases very severe. My conclusions are the same as Dr. Sylvester's, *i.e.*, I do not feel that any one ought to use this method of treatment except in a case where it seems probable that the child is going to die. Then it is justifiable to take a desperate chance. I do not think that there was anything wrong with our technic, and it was done very carefully and by competent men.

DR. SYLVESTER (in closing): So far as I can see, our technic is the same as that of Dr. Goodman. Possibly he has made some changes in the method of treatment the last year. I remember we had two or three very severe cases; the others I do not remember so well.

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Book Reviews.

Therapeutic Immunization. By W. M. CROFTON, M.D. Philadelphia: P. Blakiston's Son & Co., 1918.

"Therapeutic Immunization" presents a new theory of vaccine therapy, which is being practised by the author with satisfactory results. The three classes of microbes—saprophytes, symbiotics, and parasites—and their effects upon the human tissues are discussed. The two classes of toxins, exotoxins and endotoxins, and antitoxins are described. The way in which the animal organism deals with the microbial cells is considered in a chapter dealing with bacteriolysis and phagocytosis. Two other substances occurring in serum of infected or immunized animals—agglutinins and precipitins—and their intravital reactions are considered. The book discusses, besides these immunity mechanisms, prevention and therapeutic treatment. The author explains his theory of dealing with the alimentary canal, the respiratory, urino-genital, vascular, lymphatic, and nervous systems, as well as the skin, bones, joints, and wounds, from the standpoints of pathology, bacteriology, immunity, prophylaxis, and treatment. The infections produced by streptothrices are briefly considered.

The Modern Milk Problem. By J. Scott MacNutt. New York: The MacMillan Co., 1917.

This book surveys the milk problem in the United States. It supplies practical information as to the control, the sanitary supervision, and the economic factors of the milk supply. It explains why there is a milk problem: milk is one of the most valuable and most extensively used of all foods; it is the food most dangerous to health. Many difficulties arise from the separation of the producer and the consumer, and from the complexities which urban development necessitate. The book traces the development of sanitary improvement and discusses such factors as certified milk, the scorecard method of inspection, the North system, infant welfare stations, laboratory tests and standards, pasteurization, clarification, and other processes. The importance of publicity of ratings, contests, conferences, and exhibitions, is mentioned, and grading systems are described. The author explains that the crux of the economic question lies in the fact that everything used in the production of milk has increased in cost, while the price of milk has failed to rise proportionately. Grading and laboratory tests and the advantages of centralization are discussed. Health authorities, legislation, agricultural authorities, the dairy farmer, the dealer, and the consumer, must all coöperate in solving the milk problem.

Medical Research and Human Welfare. By W. W. Keen, M.D., LL.D. Boston and New York: Houghton Mifflin Co., 1917.

This volume is a record of the author's experiences and observations during a professional life of fifty-seven years. It discusses the factors which have been of invaluable assistance in promoting human welfare: research, anesthesia, new instruments, and bacteriology. The life and achievements of Pasteur and Lister are commented upon. In the author's experience, medical research has practically conquered the following diseases: anthrax, puerperal fever, hydrophobia, tetanus, smallpox, cholrea, bubonic plague, yellow fever, malaria, the hookworm, typhoid fever, diphtheria, and others. Many cases are described. Other experiments are recorded in the research on diseases of plants and animals. This book is an amazing record of the many ways in which human welfare has been promoted and medical science revolutionized by the research and experiments of the past century.

Good Health. By Alvah H. Doty, M.D. New York and London: D. Appleton and Co. 1917.

This volume is an attempt to tell the reader how to acquire good health and how to keep it. It includes a description of the essential points in the construction of the body, and the function of its various parts. It discusses public health problems, the maintenance of individual physical well-being, the means by which infectious diseases are transmitted, and how they may be prevented. It emphasizes the importance of pure air, good water, nourishing food, and other matters connected with the subject of hygiene. The author's aim is to substitute for the passive acquiescence of the general public in following the teaching of sanitarians, an intelligent appreciation of the fundamental principles which animate them, and a definite sense of responsibility in maintaining bodily health for both individual and social ends.

Diabetic Manual. By Elliot P. Joslin, M.D. Philadelphia and New York: Lea and Febiger. 1918.

This "Diabetic Manual" presents the modern conception of diabetes and its treatment. The book is arranged in four divisions. The first part gives a brief survey of the fundamental conceptions of the subject. Part two gives a more detailed and technical account of diabetic treatment. The third division contains diet tables and recipes which have been used by the author with success. Part four describes laboratory tests useful in modern diabetic treatment for the estimation of sugar and acid bodies in the urine, of the sugar in the blood, and of carbon dioxide in the alveolar air.

In discussing the treatment of diseases, methods are suggested to decrease the work which the organ is called upon to do, and at the same time, to stimulate the organ to utilize its power more effectively. Diseases of the heart, kidneys, vessels, respiration, the gastro-intestinal tract, general metabolism, other chronic diseases, and specific infectious diseases are discussed, showing that the object of therapeutics is not to restore anatomical integrity, but to improve functional efficiency.

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BOSTON'S NEW HEALTH COMMISSIONER.

The Journal is glad to extend the cordial greetings of the Boston profession to Dr. William C. Woodward, the new health commissioner of this city, whose service here began on August 1.

Dr. Woodward possesses training qualifications which fit him particularly well for municipal health administration, for he is both a physician and a lawyer. The latter training enables him to avoid many of the embarrassments of the ordinary official unacquainted with the legal aspects of the health problem.

Besides administering his office in Washington for 24 years in a way which has brought strong commendation from succeeding boards of commissioners in the District of Columbia, Dr. Woodward has lectured on state medicine and medical jurisprudence at Georgetown, George Washington and Howard Universities in Washington. At a recent interview he is reported to have said:

"A great many of our best physicians and sanitarians have been claimed by the government service, and in many cities, in consequence, there have been serious obstructions placed in the way of efficient health administration. We have encountered this difficulty here in Washington, where I would venture to say our work has been reduced to a basis of 70 to 80% of its pre-war efficiency on account of the disruption of our health organization.

The public health here at home must, nevertheless, be guarded and even improved during the war, and the many new problems, such as those occasioned by the entrance of great numbers of women into industry, must be solved. State and city health officials are now in conference with the Medical Corps of the army, navy and health service in an effort to work out plans which will assure adequate health protection to the cities and towns of the country during the war. I feel sure that plans adequate to meet the situation will be evolved."

As to the most important factor in efficient health administration, Dr. Woodward declared that he considered education along the lines of preventive medicine of great value.

Dr. Woodward was born in Washington. He is a graduate of Georgetown University, a member of the District of Columbia bar and a member of the District Medical Society. He has served as president of the American Public Health Association and in a similar capacity in the conference of state and provincial boards of health of North America and the American Association for the Study and Prevention of Infant Mortality. He is a director of the American Society for the Control of Cancer and an honorary member of the American Veterinary Association and of the International Association of Dairy and Milk Inspectors, besides being a Fellow of the American Medical Association. He has been a contributor both to leading medical and legal journals and has often appeared as a lecturer on various phases of public health administration.

It is no detraction from Dr. Woodward's predecessors to expect important progress under his administration. The good wishes and cordial coöperation of the medical profession will be freely given to whatever measures he may undertake in benefit and advancement of the public health.

THE ORTHOPEDIC CENTERS OF GREAT BRITAIN.

A MOST interesting article appeared recently in the *American Journal of Orthopedic Surgery* by Robert B. Osgood, M.D., Major, M.O.R.C., U. S. Army, concerning the Orthopedic Centers of Great Britain. The organization of the Orthopedic Centers groups itself about the Inspector of Military Orthopedics, Colonel Sir Robert Jones, and the Assistant Inspector, Major Paterson, Professor of Anatomy in Liverpool University. Orthopedic Centers usually consist of a certain number of beds set apart from a general military hospital. At present there are Orthopedic Centers in Aberdeen, in Edinburgh, Glasgow, Leeds, Bristol, Liverpool, Cardiff, Oxford, Belfast, Dublin, and in London, and new centers are being started in Reading, Newcastle, Southampton, Birmingham, and Manchester, and still the cry for more orthopedic beds goes up.

In Aberdeen, the Center is situated at the Old Mill Military Hospital, which is about four miles outside of the white granite Scotch city, well equipped with gymnasium curative workshops, hydrotherapy and electro-therapy, excellent operating rooms, and photographic studio. The most interesting occupation in the workshops is deep-sea fish nets. These articles are of much use, and the exercise for stiff fingers in making the mesh, and for stiff arms and legs as they sway back on the stout cord knots, is admirable.

The Center at Edinburgh is at Bangour, Lothian, fifteen miles out of the most romantic city in the world; a fine group of buildings on high ground with lovely views of the Highlands, in most attractive surroundings. The Red Cross 'bus runs up and down every day, and the men are quartered at Houston House, a mile down the road. A walk morning and night keeps them in fine trim.

Leeds is now the largest Orthopedic Center in Great Britain. A splendid commanding officer, Colonel Littlewood, the very distinguished surgeon, is in charge of a great hospital of 1800 beds, consisting of many permanent brick buildings, formerly a large school, and numerous hutments of most modern construction and remarkably well and originally planned by Colonel Littlewood. These hutment hospitals cry out against the extravagance of most of our modern hospital construction. Every factor for efficiency is considered in them,—light, heat, fresh air, cleanliness and comfort. The Children's Hospital in Boston was the first to realize that this method of construction is not only cheapest in the short run, but in the long run as well the cost per bed is enormously decreased.

The great Center at Alder Hey, near Liverpool, is the oldest, and is with Shepherd's Bush in London, the most highly developed Orthopedic Center. Large Curative Workshops, a finely equipped gymnasium, a large hydrotherapeutic plant nearly complete, an efficient electrical plant, fifty masseuses at work daily, and all the paraphernalia of a modern hospital are at the disposal of the men.

The Military Orthopedic Hospital at Shepherd's Bush is perhaps better known than any of the other Orthopedic Centers. A great municipal workhouse plant with fine buildings has been taken over, and under the administrative genius of Major Hill and with the great interest and financial help of King Manuel of Portugal, acting for the British Red Cross, has expanded to huge proportions.

The institution contains a unique hydrotherapeutic plant, comprising silent pools and whirlpool baths and sprays and douches and contrast showers; an enormous electro-therapeutic department under Bristow carries out his principles of graduated contraction for weak muscles. Curative and productive workshops on a scale far larger than elsewhere serve to maintain remarkable discipline and furnish splints and shoes and build new buildings. The plaster models of deformities of Shepherd's Bush and Alder Hey rival the best work of Caproni. A patients' orchestra and band is in constant demand in the neighborhood of London, and the whole place is a beehive of industry.

Of the first 1300 cases, representing the backwash of serious lesions and bad surgery—the scrapheap of the war—1000 returned to army service. Could anyone ask for a greater triumph of orthopedic surgery? This is true not only of the work of Shepherd's Bush. Recent statistics from other Centers which have been dealing also with this class of supposedly hopeless cases have returned on an average of 75%.

A NEW DISINFECTANT TESTING MACHINE.

An article in the Public Health Reports for April 12 describes a new disinfectant testing machine. In performing laboratory tests to determine the bactericidal power of disinfectants, some of the organisms, living or dead, upon which the disinfecting solutions have been allowed to act, are transferred at stated intervals from the disinfectant solutions to test tubes containing nutrient broth. The bacteria are thus placed in favorable conditions for multiplication, if they have not been killed by the disinfectant solution. As growth will appear in those tubes into which live organisms have been introduced, the results of the tests may be observed, and from these observations an opinion formed as to the efficiency of the disinfectant under the conditions of the test. In testing a disinfectant a number of dilutions are used, thus necessitating a number of transfers for each time interval.

It is obvious that in performing these transfers by hand only one transfer can be made at a time; thus the conditions throughout the experiment may constantly be subjected to certain variations in those important factors of time and temperature upon which the uniformity of the tests depends. Moreover, as these transfers must be made in sequence, a single error in technic, disturbing the sequence of manipulation, may ruin the entire experiment. The precise inoculation of a considerable number of tubes at intervals of 15 seconds, as is sometimes required, and in a certain sequence, using different suspensions of bacteria, is a tedious task, even if correctly done by an expert in the work. The serial inoculation may well be dispensed with if a method equally satisfactory, as regards the accuracy of the results, can be devised.

In performing disinfectant tests, the use of a machine has a certain obvious advantage over a technic depending wholly upon manual dexterity, in so far as the precision of a mechanical device is substituted for the variations in accuracy of the hand movements of one or more laboratory workers. A machine has been devised by the use of which all the transfers due to be made at any particular time interval are made at the same time and in the same way, thus securing identical conditions for each dilution of the disinfectant or disinfectants used. Furthermore, the machine makes 15 transfers at once, thus doing away with the strain of inoculating a large number of tubes singly in a certain sequence.

It has been recognized that in using a machine greater difficulty as regards the exclusion of air contamination is likely to be encountered; however, this machine has been so designed as to overcome that disadvantage.

The machine consists of the following: a table, 31 inches high, 36 inches wide, and 30 inches from front to back, supports these essential parts of the apparatus; a water bath, a large test tube rack, a traveling carriage, and a flaming device.

Actual comparison of the two methods has shown that the use of the machine greatly simplifies the practice of disinfectant testing.

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THE ROCKEFELLER FOUNDATION.

A review of the Rockefeller Foundation, by George E. Vincent, has recently been published. It describes the resources and policy, the war work, public health activities, and medical education projects of the Foundation in 1917. The society has coöperated with the Red Cross and Camp Commissions; it has carried on medical research with war surgery and sera; and it has assisted in the treatment of mental diseases in war and peace by coöperating with the National Committee for Mental Hygiene.

The Rockefeller Foundation has given valuable aid to the cause of public health by caring for the victims of infantile paralysis in New York, by fighting tuberculosis in France, and by supporting a School of Hygiene and Public Health at Johns Hopkins University. The International Health Board of the Foundation has extended its service over twenty-five foreign countries and twelve American States. It has rendered most valuable aid in controlling the hookworm in many countries, and campaigns are being made against malaria and yellow fever. This International Health Board is a unique agency for coöperative research; it has brought many governments to a realization of the value of its work and the need of assuming responsibilities and enacting sanitary laws. In the Philippines, an experiment is being made with a floating dispensary, which will have a bearing upon the international problem of dealing with backward people.

In furtherance of medical education, the Rockefeller Foundation is assisting China in establishing the Union Medical College in Peking, and by appropriating funds toward strengthening the curricula and increasing the staffs in three missionary colleges in Shanghai. Subsidies to missionary hospitals have been granted, and fellowships and scholarships for study in the United States and Europe. Furthermore, research and medical education in the United States have been fostered; one million dollars have been promised by the Foundation for creating a modern medical center at the University of Chicago. The Rockefeller Foundation is an international force, fostering world-wide organization in the interests of scientific knowledge applied to human welfare.

The Secretary's Report contains the organization and membership of the Foundation and of the Departmental Boards. In the Treasurer's Report is recorded a summary of expenditures for all work in 1917, and of the funds and property of the Foundation.

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PLAN TO DRAFT DOCTORS.

It is proposed that the Government should assume control of the entire medical profession in the United States in order to obtain sufficient doctors for the fast-growing Army, and at the same time to distribute those remaining to the localities or services where they are most needed for civilian work.

This mobilizations is to be accomplished either by enrolling all doctors in a volunteer service corps under pledge to accept whatever service, military or civilian, is assigned them by the governing body of the corps, or, if the voluntary plan is not successful, by legislation for drafting them into government service.

The conscription of medical men is no reflection on the patriotic response of the profession, but means a more complete availability and a fairer and more selective distribution of services. Doctors assigned to civilian posts would receive public recognition of their patriotic service and those appointed to foreign service would willingly undertake their duties.

"Organization plans of the Volunteer Medical Service already have been made and enrollment started in a few States under authority of the Council of National Defence. Instead of enrolling in this corps only those physicians not suitable for military service, either because of age, physical infirmity, dependency, or institutional or public need, as planned at present, the Government expected shortly to throw membership open to all doctors and to bind each with a pledge 'during the present emergency to accept service, military or civilian, wherever, whenever, and for whatever duty he may be called by the Central Governing Board.'

Under this project, the Army and Navy would take those physicians and surgeons best fitted for active duty and who can be spared from civilian requirements. At the same time the Government would maintain a continuous survey of the country and assign doctors to those communities in which there were too few. The practical operation, officials believe, would cause little of this relocation, however, since physicians who are needed in certain communities, hospitals, schools, or other essential civilian service, would not be commissioned in the Army.

Of 143,000 doctors in the United States, it is estimated between 80,000 and 95,000 are in active practice, and 23,000, or about one-fourth are in the Army or Navy. Nearly 50,000 will be required eventually for the Army. The active practitioners remaining, together with those who have retired, but who can be persuaded to resume active work, must carry on the health maintenance work in this country.

Surgeon-Generals Gorgas of the Army, Braisted of the Navy, and Blue of the Public Health Service, are considering a plan for commissioning all teachers in medical schools and assigning them to their present duties. This would constitute a means of preventing further disruption of medical teaching staffs, and at the same time recognizing the public service of those men."

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MEDICAL NOTES.

Asiatic Cholera Spreading.—Many cases of Asiatic cholera have been reported recently. Eight persons are now suffering from the disease in Stockholm, and it is spreading to Finland. In Moscow, there have been registered within twenty-four hours, 224 known cholera cases, seventy-eight suspected cholera cases and twenty-six cases of stomach disease. 120 cases have occurred in Petrograd, and in Saratov, several instances of cholera have been reported.

WAR NOTES.

Dr. Barrows Receives Commission.—Dr. H. C. Barrows of Boothbay Harbor, Maine, has been appointed first lieutenant in the Medical Reserve Corps.

Dr. Barrows is a graduate of Bowdoin College, class of 1903, and of the medical school in 1904. He will probably go to Fort Oglethorpe, Ga., for training.

Dr. Ethel E. Grant, Dentist, Sails to France.—Dr. Ethel E. Grant, a Reading dentist, has sailed for France with a Red Cross unit.

Dr. Grant is a graduate of Tufts Dental College, member of the New England Women's Dental Association, the National and the Massachusetts State Dental Associations and of Tufts Dental Alumni.

Our Patriotic Dentists.—The Dental Department has all the assistance it can possibly require for some time to come, as there are plenty of dentists now in the service to take care of a force of 5,000,000.

Examinations for dental officers have been closed and no further additions will be made to the corps for at least six months. When the United States declared a state of war with Germany its army had fifty-eight dentists. Today there are 5810. Commissions were offered to 5467 dentists in various parts of the country and 95 per cent. accepted.

The dentists of the country are to be honored for their practical patriotism, many of them abandoning highly profitable practices to serve their country. Less well known is the contribution made by members of the Preparedness League of American Dentists, numbering some 15,000, who are pledged to render at least an hour's gratuitous service a day in fitting selected soldiers for duty. Over 300,000 free operations have been performed by the organization's members within the past year. Pittsburgh has many dentists who are accustomed to give up their Saturday afternoons frequently to this patriotic work. It is only within the last few years that the relation between bad teeth and not merely sickness but deficient physical stamina has been established. Some of our new soldiers never knew what real health was until they were forced to have their teeth put in good condition. There should be widespread recognition of the patriotic service rendered by American dentists, both at home and abroad.

Jewish Medical Unit Arrives in Europe.—The Jewish American Medical Unit has arrived safely at a European port. The unit is comprised of 42 physicians, nurses, sanitarians and administrators, equipped by the Hadassah, the women's Zionist organization, for the purpose of doing relief work in the Holy Land.

There are three Boston men in the Unit. The unit is now en route for Palestine, where it will establish a public health service.

The plans of the medical unit call for the establishment of a 100-bed hospital, the opening of a branch at Jaffa and for the covering of the entire region with ambulatory dispensaries, clinics and maternity relief stations. Included in the unit are Adolph Hubbard, a local attorney, administrator; Dr. Isaac Alcazar, Boston, formerly of the Charitable Eye and Ear Department and the Ophthalmic Department of the Massachusetts General Hospital, and also visiting surgeon at the Carney Hospital, South Boston; Samuel M. Schmidt, Boston, sanitarian and formerly of the Board of Labor Industries, and Dr. Joseph Suffrin of Boston, obstetrician.

Colonel Louis Breckemin Succeeds Colonel P. F. Straub.—Colonel Louis Breckemin, Sr., U. S. A., will succeed as Department Surgeon at the Northeastern Department Colonel Paul F. Straub, who has been detailed. Col. Breckemin comes to Boston from U. S. Army General Hospital No. 11, located at Cape May, N. J. After graduating from the University of Pennsylvania about forty years ago, he joined the Army, from which he retired in May, 1916. In January he returned to active service and was stationed at Cape May for nearly six months.

First Lieutenant George C. Sanderson, U. S. R., has been assigned to the Northeastern Department medical staff as a dentist.

Prevention Work Against Lung Diseases.—It has been found advisable to establish detention camps in order to protect incoming recruits from measles and other communicable diseases resulting in pneumonia and meningitis.

The practice of the navy at the Great Lakes, the Pelham and other training camps and the result of the creation of such camps at Funston, whose divisional commander took the responsibility of ordering and maintaining them, prove beyond question that they are a protection to the enlisted men against the much dreaded respiratory diseases, and that the recommendation of the surgeon-general of the army that they be established is worthy of adoption. It appears, however, that, despite his recommendations, the war department has failed to give the matter favorable consideration.

Gift for Scottish Women's Hospitals.—The American Red Cross has given another $150,000 to the Scottish women's hospitals in recognition of their efficient work at the front in France during the past two months. The gift will be payable in three instalments, beginning Aug. 1.

Indian School Abandoned.—The Carlisle Indian School in Carlisle, Pa., has been abandoned and turned over to the War Department for hospital purposes and the rehabilitation and reëducation of sick and wounded soldiers.

The school was originally an Army barracks, but was assigned to the Interior Department until needed.

Cato Sells, Commissioner of Indian Affairs, said this meant that the famous school would cease to exist and its students would be transferred to other Indian schools.

Hospital Huts Reach London.—The first shipment of the 150 hut hospitals which the American Red Cross has built in the United States for use in the 80 small American camps throughout Great Britain has arrived in London.

The huts could not be constructed in England, on account of the shortage of lumber, without crippling important war work, so the American Red Cross had them shipped in knockdown form, thus getting them into a smaller cargo space than would have been required even for the lumber to build them.

Appointments for Medical Men.—The following appointments in the Medical Reserve Corps have been announced:

Major, Daniel Fiske Jones, Boston.

Captains, Frederick Scales Towle, Portsmouth, N. H.; S. H. Blodgett, Boston; F. H. Allen, Holyoke.

First Lieutenants, G. A. Buckley, Brockton; S. N. Vose, Boston; D. H. Boland, Worcester; T. H. Kenney, Northampton; G. L. Chaffin, Boston; S. P. Hilde, New Bedford; N. N. Levins, Boston; E. J. Meyer, Somerville; F. L. Gibson, Holyoke; E. F. Hull, West Stockbridge; H. L. Sullivan, Roxbury; Harvey Clifford Bundy, Lakeview, Me.; George Braden Hunter, West Brattleboro, Vt.; John Marshall Page, Littleton, N. H.; George Alfred Schneider, Island Falls, Me.

Reconstruction Unit.—Another unit of reconstruction aides has been selected for service in France. All members of the unit are women and will be assigned to base and general hospitals to aid in physical and mental reconstruction of disabled soldiers.

Royal Park for Red Cross Hospital.—The proposal to establish an American Red Cross hospital in the grounds of Windsor Castle has been discarded, owing to the difficulties that would be encountered in draining the soil. The high ground in Richmond Park, overlooking the Thames, has been selected for the purpose The new site is close to the South African hut hospital, where there are already nearly 100 Americans.

War Relief Funds.—On July 22, the totals of the principal New England War Relief funds reached the following amounts:

Belgian fund	$685.041.46
French Orphanage fund	383,969.18
French Wounded fund	380,658.23
Armenian-Syrian fund	309,722.27
Italian fund	188,661.69
Permanent Blind fund	143,288.98

Health Conditions Good in the Navy.—The Navy reports its health conditions as remarkably good and the admission rates to the hospitals lower than it had anticipated. For several weeks continuously the sick list for the entire Navy from all injuries and diseases has been kept well below the peace time average. The first six months of the present year, which include the bad months from a health standpoint, showed a general admission rate for the principal shore stations, where ordinarily there is more sickness than among a corresponding number of seasoned men afloat, less than the average rate for apprentice seamen and other unseasoned men for corresponding periods in peace time years preceding the outbreak of the war. The death rate for all diseases has averaged between 1.4 and 2.0 per thousand per annum during recent weeks.

These results are due to the fact that the strict discipline of the Navy, especially in regard to health regulations, has been maintained, even though the personnel has been expanded five times its original size. Close coöperation of the Bureau of Navigation and other bureaus concerned in the maintenance of health conditions have played an important part in the prevention of sickness.

APPOINTMENTS FOR TWO AMERICAN SURGEONS.—Dr. Fred Bates Lund has just been commissioned lieutenant-colonel in the Medical Reserve Corps.

Dr. Lund was born in Concord, N. H., in 1865. He prepared for college at Andover and entered Harvard in 1884. He graduated from Harvard in 1888, one of the first scholars of his class and was chosen a member of the Phi Beta Kappa. He received the degree of A.M. in 1892.

In the fall of 1888 he entered the Harvard Medical School and while still a student he was appointed a surgical house officer at the Massachusetts General Hospital. He served in that capacity from 1890 to 1893.

On leaving the hospital he was appointed an assistant instructor in surgery at the Harvard Medical School and later was chosen assistant visiting surgeon to out-patients at the Boston City Hospital.

During the past few years he has been a senior visiting surgeon at the City Hospital. He is a consulting surgeon at Quincy City Hospital and the Josiah Hale Hospital. He has been assistant editor of the BOSTON MEDICAL AND SURGICAL JOURNAL and author of various surgical papers.

Before the United States entered the war, Dr. Lund was surgeon-in-chief of one of the units which went overseas to assist the British Expeditionary Forces.

Dr. Daniel Fiske Jones has recently received a major's commission in the Medical Reserve Corps.

Dr. Jones was born in Minneapolis, Minn., June 2, 1868. He graduated from Harvard University in 1892 and Harvard Medical School in 1896. On receiving his degree from the Medical School he was appointed a surgical house officer at the Massachusetts General Hospital.

In 1903 he was appointed a visiting surgeon to the Out-Patient Department of the Massachusetts General Hospital, and in 1912 was promoted to assistant visiting surgeon to the main hospital. He is also a consulting surgeon to several New England hospitals.

Dr. Jones was surgeon-in-chief of the Harvard surgical unit which went abroad in 1916 for service with the 22d General Hospital of the British forces in France. He remained there six months.

He is a member of the American College of Surgeons, American Medical Association, Society of Clinical Surgery, Interurban Surgical Society, Massachusetts Medical Society, and other social and professional organizations.

THE PREVENTION OF DISEASE IN THE WAR.—A pamphlet by Louis Livingston Seaman, M.D., called "The Prevention of Disease in the War," is of utmost importance at this crisis. He righteously pleads for more power for the Medical Department of the Army, and reviews the results of the Spanish-American war in Cuba and Porto Rico and in the Philippines as a warning to Congress. Dr. Seaman reminds us that in the Spanish War there was about one casualty to thirteen deaths from preventable diseases. He believes that a similar tragedy can be averted in this war by giving the medical officer authority to enforce sanitation, and supervise control over the rations of the troops.

The JOURNAL has reviewed recently the author's book, "Shall Disease Triumph in Our Army?", emphasizing the same need of reform in the Medical Department.

REHABILITATION OF TUBERCULOUS SOLDIERS.—The June Bulletin of the National Tuberculosis Association contains the following article concerning the rehabilitation of disabled soldiers and sailors.

"A pressing problem of the war is the vocational rehabilitation of disabled soldiers and sailors. Legislation is pending and there are the usual inevitable differences of opinion as to departmental control, in which the War Department, the Bureau of War Risk Insurance, and the Federal Board of Vocational Education are involved. A Committee on Federal Legislation of the National Tuberculosis Association is giving continuous and intensive study to the whole situation, but with particular attention to the needs of the tuberculous. It is the policy of the Surgeon-General that no disabled soldier shall be discharged from the Army until he shall have been cured, or as nearly cured as his disability will permit. By 'cured' is meant functional restoration.

It is of special importance that men suffering from tuberculosis shall have prompt and continuous care, which, in the vast majority of cases, would not be possible if they were permitted to leave the service entirely at their own discretion. The will to get well is not very strong in the average man. Military supervision will be of vast benefit in bringing about an arrest of the disease, as was pointed out more fully in the Bulletin for March. The Surgeon-General's office appreciates that difficulties will be met in holding tuberculous soldiers indefinitely. It is possible that a time limit of three months will be placed upon compulsory treatment in the army sanatorium, and that thereafter the soldier may be discharged upon his own request.

It is considered desirable to have a tuberculosis sanatorium connected with the special hospitals or reconstruction units, of which there is to be one in each of the sixteen military divisions of the country. The government sanatoria for tuberculosis, to be located at Denver, Colo.; Azalea, N. C.; and Otisville, N. Y., are now under construction. There are more than 700 patients at Fort Bayard, N. M.; the receiving hospital at New Haven, Conn., is in full operation, and Whipple Barracks, Ariz., is being rapidly put in shape by Major Holmberg as a receiving station.

It is imperative that all tuberculosis workers be informed of the plans and progress of the Government in this direction. More detailed information will be printed in a subsequent bulletin."

Physicians Urged to Enter Service.—The following article by Captain J. Forrest Burnham, Medical Reserve Corps, has been sent recently through the *Daily Press* to the physicians of Lawrence:

"The Surgeons-General of the Army and Navy desire 7000 medical men of good character, under 55 years, today, and 3500 more within a year. Of this number, Lawrence and its three surrounding towns is asked for 30, one-half, or 15, to volunteer at once. Our territory has failed to do its share up to the present.

The war has continued over one year, and in spite of urgent appeals to the local profession, but five physicians have given up their practice and responded to our country's great and pressing need. Today, Lawrence has about 90 physicians under 55 years who are missing this unusual opportunity of adding to the name of good doctor that of brave physician.

Best medical authorities consider that the medical work of our section can be properly handled by 60 physicians and allow ample margin. The salary of medical officers can be made to support a physician's family, as the writer has seen frequently instanced in the cases of the many courageous medical friends he has met in a service of nearly a year with the colors.

It is strongly desired that relatives, patients and friends of our honorable physicians, urge them to become members of the Medical Reserve Corps and place themselves at the call of the Surgeons-General of the Army or Navy. By this means each physician may do valuable work in caring for the brave soldiers who are to win this war for us.

By a gentleman's agreement, one-half of all income collected by a stay-at-home physician, from patients of doctors in the service, is to be turned over to the family of the physician, to aid in the support of his family. In addition, all patients will be turned back to the absentee when he shall return.

The spirit of our former Lawrence medical brother, Dr. G. P. Howe, is surely looking down and asking us to complete the courageous work he so nobly began."

25,000 **Nurses Wanted.**—With the nation's reserve of trained nurses depleted because thousands are serving in military and naval hospitals both abroad and in the United States, it has become necessary to call immediately for 25,000 student nurses for training in American hospitals. A call for women between the ages of 19 and 35 has been issued. Following is the formal appeal:

"Across the sea, from France, with every closing day of the heroic struggle of our fighting men, there comes a more imperative call to the women of America to assume their full share of responsibility in winning this world war for the right of men, women and nations to live their own lives and determine their own fortunes.

There exists now an extreme necessity for at least 25,000 women of character, intelligence and education to fill the gaps in our hospital staffs caused by the calling of many thousands of skilled nurses to the fighting front. There is only one way to fill these gaps: by keeping our hospital training schools supplied with students, who are not only preparing for service abroad and at home at the end of their course and at the same time are equipping themselves to earn their living in one of the noblest of professions, but from the very outset of their course are serving their country as well as learning.

The Surgeon-General of the United States Army, the Surgeon-General of the United States Public Health Service, the American Red Cross, the General Medical Board, and the Woman's Committee of the Council of National Defence therefore unite in an earnest appeal for 25,000 young women, between the ages of 19 to 35 to enroll in what shall be called the United States Student Nurse Reserve. The enrollment will begin on July 29, 1918. Those who register in this volunteer body will engage to hold themselves in readiness until April 1, 1919, to be assigned to training schools in civilian hospitals or to the Army Nursing School, and begin their courses of study and active student nursing.

The service for which we are asking calls for the best that the womanhood of America can offer in courage, devotion and resourcefulness. We cannot go forward to victory oversea if the wives and families of our fighters are not sustained in health and strength; if we cannot protect our workers against the hazards of war industries; if we cannot defeat accident and disease, our enemies at home. Upon the health of the American people will depend the spirit of their forces in the field.

Acting on the urgency of the need, the state divisions of the Woman's Committee of the Council of National Defence are requested, through their local units, to enroll the 25,000 women needed. We ask the women of America to support us in our further effort not to lower American hospital standards and to give us the practical assurance of their support by going to the nearest recruiting station established by the Women's Committee of the Council of National Defence on or after July 29 and enrolling in the United States Student Nurse Reserve."

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending July 20, 1918, the number of deaths reported was 200, against 184 last year, with a rate of 13.30, against 12.42 last year. There were 35 deaths under one year of age, against 23 last year.

The number of cases of principal reportable diseases were: diphtheria, 50; scarlet fever, 15; measles, 83; whooping cough, 27; typhoid fever, 4; tuberculosis, 66.

Included in the above were the following cases of non-residents: diphtheria, 12; scarlet fever, 2; measles, 1; whooping cough, 1; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 2; measles, 2; whooping cough, 2; tuberculosis, 18.

DISTRICT NURSES' WORK INCREASES.—At an executive committee meeting of the Instructive District Nursing Association, the work of the past six months was reviewed. During this period 111,348 visits were made by 105 nurses, a marked increase over the work of last year. Visits to the homes of victims of the infantile paralysis epidemic have decreased from 1937 to 719 during the year. The staff supervised 87 baby-weighing stations during the recent campaign, many cases being referred to the Association for further work.

GIFT FOR HALE HOSPITAL, HAVERHILL.—By the will of Helen M. Chase, $200 has been bequeathed to the Hale Hospital, Haverhill.

CITY HOSPITAL OF WORCESTER.—The forty-seventh annual report of the City Hospital of Worcester, summarizes the work for the year 1917. 6,811 patients have received treatment, among whom were 1901 medical patients, 2407 surgical cases, 685 children, 836 cases of minor accidents, and 571 maternity patients. There were admitted to the out-patient department 5478 persons. The total number of visits was 25,744.

In the Training School for Nurses, 43 were graduated. Sixty probationers were received during the year. The kindergarten course has been continued as usual, and a course in dietetics has been added. The method of training nurses in surgical detail and technic, by means of mock operations, has been continued as in previous years. The hospital has offered a two years' training course for male nurses.

The work of the laboratory has been carried on in the usual chemical, bacteriological, and pathological divisions. In addition to the regular hospital work, the Wassermann test and complement-fixation test for gonorrhea have been done for the Worcester Health Department. The work of the roentgen department has been centralized and made more efficient.

The report contains statistical tables of operations, patients, and donations.

$200,000 BEQUEATHED TO SALEM HOSPITAL.—The Salem Hospital authorities have announced that by the will of John E. Maynes, formerly of Salem, the hospital has been bequeathed the Maynes estate in Salem, consisting of a business block in Essex Street, with an assessed valuation of $203,200. This property has been given to the hospital corporation, with the provision that a bronze tablet be erected and maintained in commemoration of Mr. Maynes' father and mother. The corporation has within the past year erected a new hospital in Highland Avenue, to replace the old hospital which was destroyed in the Salem fire.

$1000 BEQUEATHED TO FRAMINGHAM HOSPITAL.—By the will of Cynthia A. Kendall of Framingham, $1000 has been bequeathed to the Framingham Hospital.

TRAINING FOR PUBLIC HEALTH NURSING.—Forty young women have just enrolled in the Simmons College Instructive District Nursing Association Training School for public health nursing. Twenty of these students are graduate nurses and twenty are third-year pupil nurses, who, under the recent agreement between certain nearby hospitals and the training school—the object of which is to increase the number of public health nurses as speedily as is consistent with thorough training—are released from hospital duty to a four months' training in public health work. At the end of this period the pupil nurses will return to the hospitals, and with the hospital diploma will receive certificates as public health nurses, the four months of special study being included in the regular three-year training period.

RED CROSS HOSPITAL AT BUZZARDS BAY.—Through the generosity of William M. Wood, president of the American Woolen Company, the Red Cross has been able to open a convalescent hospital on the island of Cuttyhunk, Buzzards Bay. Mr. Wood has not only furnished the house, but will maintain it throughout the war for the use of wounded sailors and soldiers who are sufficiently recovered to recuperate at the seashore. Both the Red Cross and the State of Massachusetts are entitled to the use of the hospital, which is situated on the Wood estate. Dr. Norman E. Ditman is in charge of the work and the organization. As yet there have been no soldiers from France quartered there; and only a few from the camps and cantonments in the United States have been sent that far from the local hospitals. But in the near future the Red Cross expects to find good use for the hospital. Dr. Ditman has already sent a request for moving picture films to A. J. Philpott, publicity manager of the New England Red Cross division.

BABY HYGIENE ASSOCIATION.—According to an estimate based upon last year's figures and the growth of the work of the organization during the first six months of 1918, the Baby Hygiene Association will care for 6800 Boston babies during 1918.

For the first six months of the year, 4711 babies have been under supervision, an increase of 886 babies, or 23% over the figures for the corresponding period of last year.

During the past six months 480 medical conferences have been held, an increase of 78 over last year. The total conference attendance was 15,762, with an average of 33 per conference. This average is slightly lower than last year.

The number of visits by nurses for the six months was 35,012, an increase over last year of about 2800. For the first six months of 1917 there were 97½ months of nursing service, an average of a little more than 16 nurses a month. This year there have been 114¾ months of nursing service, with an average of 19 nurses a month.

The month of June compares most favorably with June of last year, the total number of babies cared for during the month being 3363, or 862 more than last year, and there have been more than one hundred new babies admitted. The number of conferences and the conference attendance have increased, and the average attendance has held the same as last year. The weekly registration continues to increase at a much more rapid rate than last year, reaching on June 29 a total of 3089 registered babies. The number of conferences held each week is now twenty, and last week the attendance was 952.

The Grove Hall Station, with a registration of 252 babies, now has two nurses and two medical conferences each week. The old East Boston Station, with a registration of 261, also has two nurses, making the number of staff nurses at the present time 21. The new station at the Trinity Neighborhood House and Day Nursery has a registration of 194, which makes the registration for East Boston about 450. The registration at Upham's Corner is 119, and with an average conference attendance last month of 34, this station can rank with some of the older stations. At Jamaica Plain the registration is 71. The growth of this station has been much less rapid, but during the summer months the Association hopes to increase the registration.

HEALTH DEPARTMENT OF BOSTON.—The monthly bulletin of the Health Department of the city of Boston, for May, 1918, contains a timely suggestion on the subject of health fatigue. Young men and women are urged to consider their health, and not large wages, of primary importance. The war has necessitated an increase in the activities of the people, but the individual cannot work long hours and maintain his maximum efficiency, which is essential to the proper conduct of the war. Physical fatigue lowers resistance to disease. In order to supply the needs of the nation, industrial health must be safeguarded.

Another article published in this issue explains the efficacy of sun baths in maintaining health. The sun bath is especially applicable to all forms of disordered nutrition, to chronic dyspepsia, neurasthenia, exophthalmic goiter, Bright's disease, chronic rheumatism, and skin diseases.

Among other topics discussed are the importance of the teeth in the prevention of gastric ulcers, the condition of acidosis, and Fourth of July tetanus.

A report is made on recent Massachusetts legislation. Bills have been passed dealing with the physical examination of inmates of penal institutions, reports and records of venereal diseases, certificates of exemption from vaccination, the reporting of dangerous diseases to local boards of health, to the State Department of Health, the licensing of dispensaries, and prosecution for the selling of adulterated vinegar.

In the statistical record are reported 983 deaths, and 179 babies cared for. There are given statistics of medical inspection, of the bacteriological laboratory, of food, milk, and sanitary inspection, and of communicable diseases. A monthly meteorological summary is given for May.

TRAINING SCHOOLS FOR NURSES IN MASSACHUSETTS.—The Massachusetts State Nurses' Association has issued a survey of Training Schools for Nurses in the State of Massachusetts. The hospitals approved by the Association, both for regular training and for post-graduate work, are listed, with a brief description of their general equipment and the requirements for admission and graduation.

PENIKESE ISLAND FOR LEPERS.—The Federal Government is considering Penikese Island, the leper colony of Massachusetts, as the place for confining all the lepers in the United States.

Dr. George W. McCoy, director of the hygienic laboratory, and Dr. William C. Woodward of the United States Public Health Service, have just completed an investigation authorized by Congress.

There are 1000 lepers in the United States, according to estimate. Massachusetts is now caring for twelve at the island. Not all suffering from the disease are confined. Secretary Robert W. Kelso of the State Board of Health believes that were the State to be combed at least fifty cases would be uncovered.

Leper colonies also exist off the coast of Louisiana and in the Honolulu Islands. The federal officers will inspect them as possible sites for the national leprosorium. Mr. Kelso is of the opinion that unsuitable climatic conditions of New England may cause the selection of a more southern site. This action would cause the abandonment of Penikese as a leper colony.

MASSACHUSETTS HEALTH COMMITTEE.—To solve public health problems, brought to a focus by the war, representatives of leading health conservation associations have organized the Massachusetts Health Committee, with the following officers.

Dr. Eugene R. Kelley, State Commissioner of Health, chairman; Miss Gertrude W. Peabody, vice chairman of the Child Welfare Department of the Council of National Defence, treasurer; Charles E. Bellatty of Boston University, director.

Other members of the committee are Bishop William Lawrence, representing the Society of Social Hygiene; Dr. Edward Reynolds, director of the American Society for the Control of Cancer; Dr. G. M. Kline, director of the Massachusetts Commission on Mental Diseases; Dr. V. Y. Bowditch, president of the Massachusetts Anti-Tuberculosis League; and Dr. Richard M. Smith, member of the Child Conservation Committee of the State Department of Health.

The committee has a substantial working fund, which it will use to help the War Department make the young men in Massachusetts "fit to fight," and to coöperate with other agencies to lower the mortality rate for the State.

Through the courtesy of President L. H. Murlin the committee will maintain headquarters at the College of Business Administration of Boston University.

War School in Bacteriology.—The Harvard-Technology School of Public Health is offering to men and women intensive courses in bacteriology, chemistry, and the various divisions of health work and administration. The enrollment includes twenty women and nine men. The school is the outcome of an effort made by Dr. W. T. Sedgwick to train women to take the places of men in laboratories in base hospitals.

The work will be pointed directly toward the training of laboratory technicians, and the courses will include bacteriology, chemistry, industrial hygiene, vital statistics, sanitary science and public health, laboratory methods, and the various laboratory tests for infectious diseases, together with military hygiene and preventive medicine. Most of the work will be done in the laboratories at Tech, the purely medical items being taken care of at the Harvard Medical School. Bacteriology will be taught by C. C. Stockman, 2d, a graduate of M. I. T., and an instructor in the regular courses; chemistry will be in charge of Professor Edward Mueller, whose specialty at the Institute is bio-chemistry; Dr. Slack, long with the Boston Board of Health, will teach the laboratory methods; while the infectious disease tests will be under the care of Dr. William A. Hinton of Harvard. The registrar and general manager of the work is W. E. Brown, instructor in the Harvard-Technology School under the general supervision of Dr. Sedgwick. Dr. M. J. Rosenau, who is director of the school, and Professor George C. Whipple will aid if occasion needs.

This intensive school has called for students of the highest class and a majority of those registered bear college degrees. Radcliffe is represented by five of the womn, Wellesley by four, and Simmons, Smith, Mount Holyoke, Oberlin and Oregon Aggie by one each, while the men come from Harvard, Bates, Dartmouth, Tufts, Trinity, and Johns Hopkins.

Gifts to Hospitals.—By the will of Dr. John E. Somers, Cambridge, $1000 has been bequeathed to the Carney Hospital of South Boston. The residue of his estate has been left to the Holy Ghost Hospital.

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Correspondence.

CHANGES IN SURGICAL TREATMENT.

Westport, Essex Co., New York,
July 15, 1918.

Mr. Editor:

Things come and things go. In surgery this is eminently true.

When I was a medical student in Paris, 'way back in the 1860's, Maisonneuve, a great surgeon of the Hôtel Dieu Hospital, after an amputation, put a rubber cap around the fresh stump, made a vacuum with a pump and then covered the raw surface with a very thick layer of cotton. In this way, he claimed to get the best obtainable results.

Later, we had advanced Listerism and the abundant use of carbolic acid. I remember operations at the New York Hospital, where, during them, the atmosphere was strongly impregnated with carbolic spray and solutions of the acid were always used in wound dressings.

Then came the days of bichloride of mercury. For several years this powerful antiseptic and poison was the indispensable agent in all wound treatment. With the passing of bichloride, we had insistence upon free drainage and liberal use of sterilized salt solution. Still later, painting the skin of the patient with tincture of iodine, without preliminary washing, was recognized as a valuable surgical advance. Even abdominal sections were thus made with relative impunity, and great faith existed as to the worth of this method of local disinfection. Only a short time since, Carrel showed that frequent, or constant, irrigation with a mild detergent solution, is far preferable to the use of powerful antiseptics.

Finally, we have greater insistence than ever before, and especially at the front after a battle, upon free excision of all mutilated parts from shell or shrapnel, followed by sewing up of wounds immediately afterwards so as to ward off infection and get union by first intention. In what is truth?

Times and customs change. So do treatments surgical. I believe we shall ere long go back to some applications and doings of the old time because they are more nearly correct. A few among us have found out again that a poultice is at times preferable to the ice-bag, and leeches and venesection may save lives now often sacrificed.

Alcohol, pure or diluted, was the favorite wound dressing of the famous French surgeon Nélaton in 1865. It was again vaunted by Senn in 1898 during the Spanish-American war as being the best up to date. To me this affirmation still remains true. Not only is it the best wound dressing, it is also the simplest.

Beverley Robinson, M.D.

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SOCIETY NOTICE.

Middlesex South District Medical Society.—The regular midsummer meeting of the Society will be held on Wednesday, July 31, 1918, at the Villa Napoli, Nantasket Beach. A fish dinner will be served at 1.30 p.m. Steamers leave Rowe's Wharf at 11.15 and 12.15. Baseball field available; also an opportunity for swimming. Business: To see what action the Society will take towards reimbursing the Treasurer of The Massachusetts Medical Society for the dues of members who have enrolled in the Medical Reserve Corps.

Charles W. Adams, *Secretary.*